JPRS 75180

21 February 1980

USSR Report

INDUSTRIAL AFFAIRS

No. 530

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50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 75180	2.	3. Recipient's Accession No.

4. Title and Subtitle
USSR REPORT: INDUSTRIAL AFFAIRS, No. 530

5. Report Date
21 February 1980

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Joint Publications Research Service
1000 North Glebe Road
Arlington, Virginia 22201

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
As above

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains information on the development and productivity of the automotive and tractor industry; electronic and precision equipment; metalworking equipment; construction equipment and building materials.

17. Document Analysis a. Descriptors

USSR
Automotive Industry
Agricultural Machinery
Construction
Construction Materials
Construction Equipment
Electronics Industry
Metalworking Equipment
Economics

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 2C, 5C, 13C, 13F, 13H, 13I, 13M

18. Availability Statement
Unlimited Availability
Sold by NTIS
Springfield, Virginia 22161

19. Security Class (This Report) UNCLASSIFIED

20. Security Class (This Page) UNCLASSIFIED

21. No. of Pages 57

22. Price

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

JPRS 75180

21 February 1980

USSR REPORT

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

GOSSTROY ANNOUNCES THE MAIN NEW CONSTRUCTION PROJECTS OF 1980

Moscow STROITEL'NAYA GAZETA in Russian 4 Jan 80 p 1

[Article by USSR Gosstroy First Deputy Chairman A. D. Deminov: "The Concluding Stage of the Five-Year Plan"]

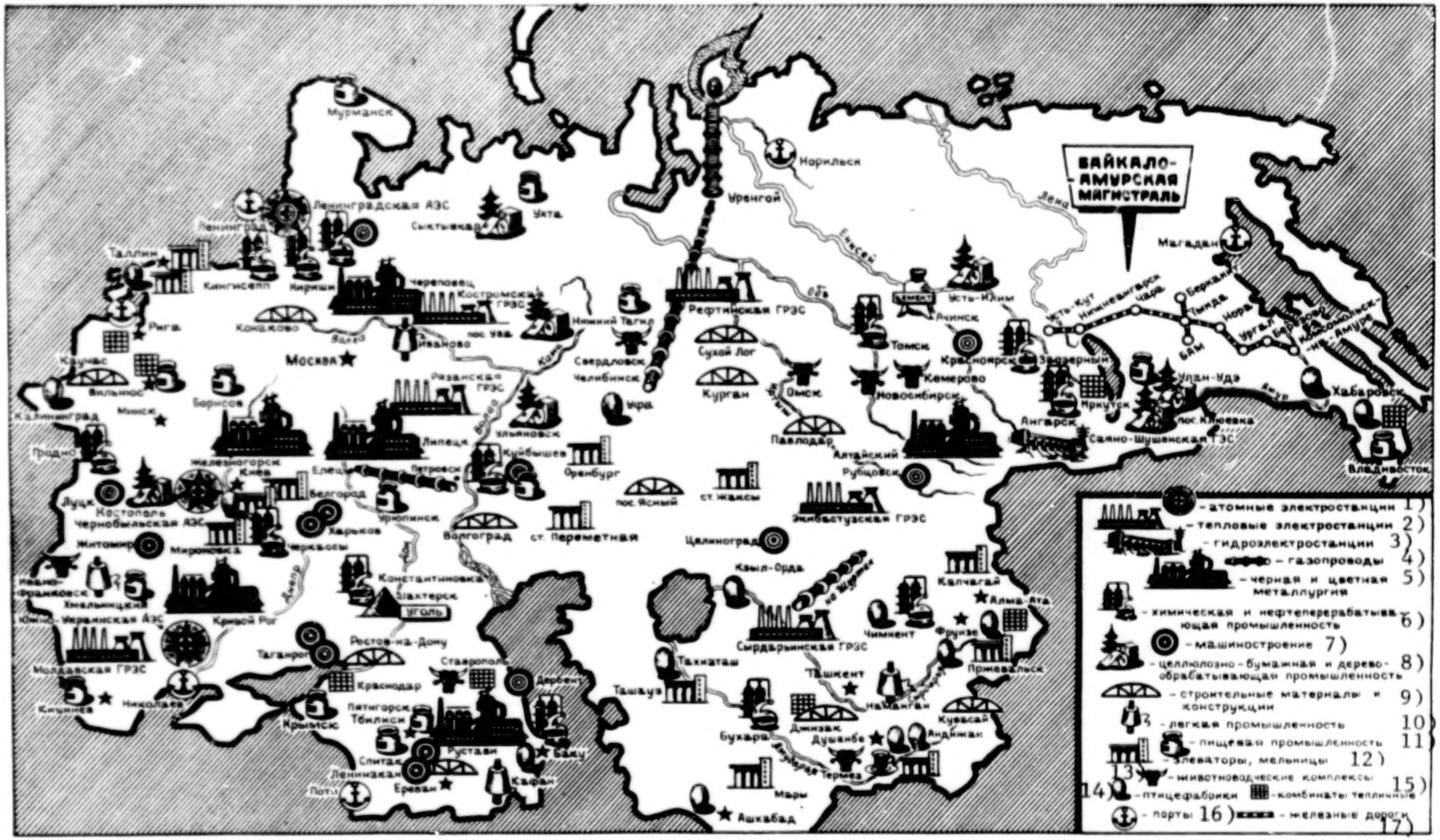
[Text] As with all Soviet people, the laborers of our sector initiated the final year of the 10th Five-Year Plan in a good mood, full of strength and creative energy. They have initiated it at a time when the whole peoples socialist competition in honor of the 110th anniversary of V. I. Lenin's birth is gathering steam, and preparations are beginning for our party's 26th congress.

There are many achievements with which we can be happy in the past years of the 10th Five-Year Plan. Builders made a substantial contribution to the development of our country's economy. During this time the volume of assimilated capital investments exceeded 5 billion rubles. Now the cost of fixed productive capital in the national economy is more than a trillion rubles. More than 900 large enterprises were placed into operation in 1976-1979.

The November (1979) Plenum of the CPSU Central Committee and a session of the USSR Supreme Soviet spelled out new goals. One hundred fourteen billion rubles were allocated from the state budget to expansion and renovation of fixed capital in 1980. Let me recall, meanwhile, that the total volume of annual state capital investments, 119.1 billion rubles, is 6.6 billion rubles more than foreseen by the five-year plan.

As before, much significance is attached to reequipment and reconstruction of existing enterprises. It has been decided to spend 2.4 billion more than required by the five-year plan for these purposes. I should note that the structure of the capital investments is improving. Judge for yourself: The proportion of outlays on equipment will increase to a mandatory 38.7 percent; compare this with the 35.5 percent planned.

Much is being done to insure harmonious and dynamic development of all national economic sectors with a consideration for regional interests. Take a look at the map accompanying this article, and persuade yourself.



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Key:

1. Atomic electric power plants
2. Thermal electric power plants
3. Hydroelectric power plants
4. Gas pipelines
5. Ferrous and nonferrous metallurgy
6. Chemical and petroleum refining industry
7. Machine building
8. Pulp-and-paper and woodworking industry
9. Building materials and structures
10. Light industry
11. Food industry
12. Elevators, mills
13. Livestock complexes
14. Poultry factories
15. Hothouse combines
16. Ports
17. Railroads

The country's fuel and power potential is to grow further. Atomic power is developing in compliance with decisions of the 25th CPSU Congress. According to this year's plan new power production blocks must go into operation at the Leningradskaya, Yuzhno-Ukrainskaya, Chernobyl'skaya, Smolenskaya, and Kol'skaya AES. Work is proceeding on a broad front in hydraulic engineering construction. Builders are to make operational the fourth and fifth turbines of the Sayano-Shushenskaya GES, each with a capacity of 640,000 kilowatts, they must achieve the planned capacity--1.9 million kilowatts--at the Far East's first-born of hydroelectric power production--the Zeyskaya GES, and they are to prepare new machine units for operation at the Nizhnekamskaya and Cheboksarskaya electric power plants.

Thermal power engineering will take one more step along the road of technical progress. We await the commissioning of a unique machine unit in the third generation of the Kostromskaya GRES with an output capacity of 1.2 million kilowatts. Large power production blocks are to begin supplying current at the Reftinskaya, Syrdar'inskaya, Ryazanskaya, and Moldavskaya GRES. The plans for this year call for starting up two machine units with output capacities of 500,000 kilowatts each at the Ekibastuzskaya GRES-1. Due to greater effort by the builders, the electric power production capacity will increase 4 percent this year in comparison with last year, and it will attain 1,295,000,000 kilowatt-hours.

Mine builders will make their contribution to the development of the fuel and power base. In the Donets Basin, they are to finish their work on, and submit to the operators, the first generation of the Zhdanovskaya-Kapital'naya Mine No 1, which will produce 2.1 million tons of coal per year. New coal mining facilities must also appear in Krasnodon (Voroshilovgradskaya Oblast), Mezhdurechensk (Kemerovskaya Oblast), and the town of Listvyanskiy (Novosibirskaya Oblast).

Many projects have been planned for the developers of petroleum and gas deposits. Inaugural projects include the almost thousand kilometer petroleum pipeline section from Surgut to Polotsk, a 608 kilometer section of the Petrovsk-Yelets gas main, and a second gas pipeline from Urengoy to Chelyabinsk. The map shows new output capacities for extraction of iron ore at the Mikhaylov Iron Ore, Yuzhnyy, Novokrivorozhskiy, and Tsentral'nyy mining and concentration combines. Producers are awaiting completion of the reconstruction of a second blast furnace at the Rustavi Metallurgical Plant, initiation of a new steel smelting operation at the Novolipetsk Metallurgical Plant, and the commissioning of rolling mills at the same plant in Lipetsk and in Cherepovets. Implementation of this year's plan will mean attainment of a smelting volume of 115.1 million tons for pig iron, 156.8 million tons for steel, and 109 million of finished rolled metal.

Preparations are being made to introduce primary petroleum refining capacities into operation at the Baku Plant imeni XXII s"yezda KPSS, and crude petroleum cracking facilities are to be made operational at the Kirishi and Kuybyshev petroleum refineries. There are plans for commissioning power production capacities in Chimkent. Mineral fertilizer production is to be increased at the Cherkassy Azot Association and the Kingisepp Fosforit Association.

Machine building is rightfully called the backbone of the socialist industry. If we are to expand and renovate the fixed productive capital and accelerate scientific-technical progress, we must have its products. This is why much attention continues to be devoted to this sector's development. The inaugural program for the oncoming year foresees completion of work at many facilities undergoing construction and reconstruction. The end goal is to increase the output capacities for production of steam turbines in Leningrad and Khar'kov, of machine tools in Kuybyshev, Derbent, and Zhitomir, of forging and pressing tools in Leninakan and Taganrog, and other machine building products.

Much significance is attached to accelerated development of the production base of construction industry, and the machinery and mechanism pool. There are plans for spending 3.9 billion rubles for these purposes. Creation of a number of interrayon and interoblast enterprises producing outfits of industrial articles for fully prefabricated construction of building structures is foreseen.

The inaugural construction projects of construction materials industry include the Kiyembayevskiy Asbestos Mining and Concentration Combine--a CEMA construction project, and new asbestos-cement sheet production operations at the Sukhoy Log and Kuvasay combines.

The volume of work done on facilities of light industry will increase by more than a time and a half in comparison with last year, while in food industry the increase will be 15 percent and in meat and dairy industry it will be 19 percent.

Rural construction is to proceed on an unprecedented scale: The state has allocated 25 billion rubles in capital investments just for this alone.

There are plans for commissioning new elevators in Belgorodskaya, Orenburgskaya, Kiev, Ural'skaya, and Turgayskaya oblasts, and in the Armenian SSR. Large livestock complexes will appear in the Balkovskiy Sovkhoz of Stavropol'skiy Kray, Prutskoy Sovkhoz of Altayskiy Kray, Mariupol'skiy Kolkhoz of Donetskaya Oblast, and in other places. Many poultry factories and hothouse combines will go into operation.

Now a few words about transportation facilities. New rail lines will go into permanant operation between Synya and Usinsk in the Komi ASSR, between Agriz and Krugloye Pole in the Tatar ASSR, and between Lake Malinovoye and Lokot' in Altayskiy Kray. Construction of the Baykal-Amur Rail Trunkline will continue--it will grow another 400 kilometers longer during the year. The second set of tracks will be laid, a number of railroads will be electrified, and many marine and river ports and freight handling complexes will be erected.

It stands to reason that the map shows only some of the most important inaugural construction projects. As with the entire national economic plan, the vast program of construction and installation is permeated with a concern for raising the standard of living of the Soviet people. There are plans for building a total of 109.4 million square meters of housing this year. We can confidently state that the decisions of the 25th CPSU Congress on improving housing conditions will be implemented successfully.

The multimillion army of builders faces complex and important tasks in the oncoming year. This year is not only the final year of the present five-year plan, but is also the foundation of the 11th Five-Year Plan. We will have to apply a great deal of effort to eliminate the shortcomings in capital construction discussed at the November (1979) Plenum of the CPSU Central Committee by CPSU Central Committee General Secretary, Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev. We must achieve balance and stability in our plans, we need to accelerate construction at the least outlays and on a modern technical foundation, we must reduce the volume of unfinished construction, and we have to raise the effectiveness and quality of work in all stages of the sector's production. We must put an end to dispersal of capital investments, and to bureaucratic and provincial approaches to their utilization.

The party and government obligate us to take the necessary steps to improve the entire economic mechanism. It is the duty of every worker and of every collective to make full use of all available reserves.

11004
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

PRINCIPAL 1980 CONSTRUCTION PROJECTS ANNOUNCED

Moscow EKONOMICHESKAYA GAZETA in Russian No 1, Jan 80 p 14

[Article by USSR Gosstroy Deputy Chairman Ivan Aleksandrovich Ganichev: "The Inaugural Program of 1980"]

[Text] The country is initiating the final year of the 10th Five-Year Plan. As was noted at the November (1979) Plenum of the CPSU Central Committee and the Second Session of the USSR Supreme Soviet, an extensive program of construction has been completed since the beginning of the 10th Five-Year Plan. It would be sufficient to point out that the volume of capital investments exceeded 500 billion rubles in the 4 years (this is 10.4 billion rubles more than had been specified by the plan's targets). This exceeds the capital investments of the entire Ninth Five-Year Plan. By the beginning of 1980, the cost of fixed productive capital in the national economy was more than a trillion rubles. In 1979 it increased by 72 billion rubles, and in 1980 114 billion rubles worth of fixed capital is to be put into operation with the support of state capital investments.

The volume of state capital investments for 1980 was set at 119.1 billion rubles, which is 6.6 billion more than foreseen by the five-year plan for this year.

The growth rate of investment into rail transportation, electric power, fuel and chemical industry, ferrous and nonferrous metallurgy, and into a number of machine building sectors is rising. Heavy industry was and continues to be the firm foundation of the Soviet economy. At the same time, as we can see from the map, new output capacities are to be put into operation in light and food industry. I would like to make special mention of the fact that allocations to reequipment and reconstruction of existing enterprises were significantly enlarged in the concluding year of the 10th Five-Year Plan. We have allocated 18.4 billion rubles for this purpose, which is 2.4 billion more than required by the five-year plan for this year. The structure of capital investments is improving. The proportion of outlays on equipment will increase to 38.7 percent, as opposed to the 35.5 percent designated by the five-year plan.

The Foundation of the Soviet Economy

The entire fuel and power complex is enjoying further development. The task of accelerated construction of atomic power plants in the European part of the country, posed by the 25th CPSU Congress, is being completed. New power production blocks are being placed into operation at the Leningradskaya, Yuzhno-Ukrainskaya (Nikolayevskaya Oblast), Chernobyl'skaya (Kiev Oblast), Smolenskaya, and Kol'skaya AES.

The fourth and fifth turbines of the largest hydroelectric power plant--the Sayano-Shushenskaya plant, each with a capacity of 640,000 kilowatts, will be connected into the circuit. The Far East's first-born in hydraulic power engineering--the Zeyskaya GES--will attain its planned output capacity--1.29 million kilowatts. New hydroelectric machine units are being readied for production at the Nizhnekamskaya and Cheboksarskaya hydroelectric power plants.

The third generation of the Kostromskaya GRES will be a real giant. The output of the unique machine unit will be 1.2 million kilowatts. Large power production blocks will begin producing current at the Reftinskaya (Sverdlovskaya Oblast), Syrdar'inskaya, Ryazanskaya, and Moldavskaya GRES, as well as at the Noril'sk Mining and Metallurgical Combine imeni A. P. Zavenyagin.

The Ekibastuz fuel and power complex, which will be using cheap coal deposits, is being created at a swift pace. The third and fourth machine units of the Ekibastuzskaya GRES-1 will go into operation in 1980, each with a capacity of 500,000 kilowatts.

There are plans for starting up the first generation of the Zhdanovskaya-Kapital'naya Mine No 1 in the Donets Basin, intended to mine 2.1 million tons of coal per year. There are also plans for introducing new coal mining capacities in Krasnodon, Voroshilovgradskaya Oblast, in Mezhdurenchensk, Kemerovskaya Oblast, and in the town of Listvyanska, Novosibirskaya Oblast. A section of the Surgut-Polotsk petroleum pipeline almost a thousand kilometers long is being prepared for operation. The map shows new gas mains--the Petrovsk-Yelets line (the length of the inaugural section is 608 km), and the second line of the Urengoy-Chelyabinsk gas pipeline (the length of the inaugural section is 505 km).

The metallurgy symbols on the map indicate the locations of new iron ore mining capacities of the Mikhaylov Iron Ore, Yuzhnyy, Novokrivorozhskiy, and Tsentral'nyy mining and concentration combines. Construction of a second blast furnace will be completed at the Rustavi Metallurgical Plant. Steel smelting will increase by 500,000 tons at the Novolipetsk Metallurgical Plant following the commissioning of a new production operation. High-capacity rollings mills are to be placed into operation at the Cherepovets and Novolipetsk metallurical plants. Battery No 1, construction of which is now nearing completion at the Altaysk Coke and Chemical Plant, will produce a million tons of coke per year.

Among the inaugural projects of chemical, petrochemical, and petroleum refining industry, the map shows capacities for primary petroleum refining and crude petroleum catalytic cracking at the Baku Petroleum Refinery imeni XXII s"yezda KPSS, the Kirishi Petroleum Refinery (Leningrad Oblast), and the Kuybyshev Petroleum Refinery. A new production operation starting up in the Perm'nefteorgsintez Association will begin producing a valuable product. A large heavy petroleum residue coking operation will be started up in Krasnovodsk. New petroleum storage tanks will appear in the Latvian SSR and the Kirgiz SSR. Motor vehicle tire production will increase in Chimkent. Large mineral fertilizer production operations will be commissioned in the Cherkassy Azot Association and the Kingisepp Fosforit Association. A synthetic ammonium plant will appear in the Angarsknefteorgsintez Association, Irkutskaya Oblast. There are plans for beginning sulfuric acid production at a rate of 500,000 tons per year at the Konstantinovka Chemical Plant in Donetskaya Oblast.

The year 1980 will become one of the birth of a new giant of domestic petrochemistry--the Tomsk Chemical Plant. The first complex to be introduced here will produce 100,000 tons of polypropylene per year. The output capacities of chemical fibers and thread, synthetic resins, and plastic will grow. Such capacities are to be placed into operation in the Navoiazot and Azot associations (in Grodno).

The program of inaugural projects for the final year of the 10th Five-Year Plan includes many machine building facilities. We will increase our capacity for the production of steam turbines in Leningrad and Khar'kov, of machine tools in Kuybyshev, Derbent, and Zhitomir, of forging and pressing tools in Leninakan and Taganrog, of roller bearings in Kuybyshev and Lutsk, of tractors in Rubsovsk and Khar'kov, of agricultural machinery in Taganrog, Krasnoyarsk, and Tselinograd, and of motor vehicle trailers in Ishim, Tyumenskaya Oblast. A new production operation is to be started up in the Armenian SSR's Spitak Elevator Building Plant.

The Ust'-Ilim Pulp and Paper Plant, which is being erected with the participation of the CEMA countries, is one of the most important inaugural construction projects of 1980. The plan is to begin producing, in the fourth quarter of that year, 341,900 tons of paper pulp per year. We will significantly increase our capacity for producing lumber, wood chip panels, cardboard, and furniture at the Syktyvkar Sawmill and Woodworking Combine, Klyuyevka Experimental-Demonstration Logging Enterprise in the Buryat ASSR, the Uvinskiy Sawmill and Logging Combine in the Udmurt ASSR, the Kostopol' House Building Combine (Rovenskaya Oblast), and the Ul'yanovsk Furniture Combine.

Completion of the constantly growing volume of work will require accelerated development of construction's production base. We will be investing 3.9 billion rubles in 1980 into its reinforcement, as well as into expansion and renewal of the construction machinery and mechanism pool.

There is one more CEMA construction project among the inaugural projects--the Kiyembayev Asbestos Mining and Concentration Combine in Orenburgskaya Oblast. New asbestos-cement sheet production operations will start up at the Sukholozhskiy Asbestos-Cement Articles Combine in Sverdlovskaya Oblast and at the Kuvasay Cement Combine in Ferganskaya Oblast. A substantial increment in the manufacture of steel and prefabricated reinforced concrete building structures will be contributed by inaugural facilities of the steel building structures plant in Kalininskaya Oblast, the machinery and repair plant in Pavlodar, the Kurgana Metallic Bridge Structures Plant, the associated construction industry enterprises of Volgogradskaya Oblast, the large-panel house building combine in Rostov-on-Don, a plant of the same type in Yerevan, the Dzhizak House Building Combine in the Uzbek SSR, and the Kaunas Reinforced Concrete Articles Plant.

For Light and Food Industry

In comparison with the volume attained in 1979, the 1980 volume of construction and installation at light industry facilities will increase by more than one and a half times, it will increase by 15 percent in food industry, and it will rise by 19 percent in meat and dairy industry. New output capacities will become operational at the cotton spinning factory in the city of Dolina, Ivano-Frankovskaya Oblast, the Ivanovo Weaving Factory imeni 8 Marta, the Namangan Silk Combine of Carpet Fabrics in the Uzbek SSR, a branch of the Goris Tricot Factory in the Armenian city of Kafan, and the Vetka Cotton Spinning Factory in Gomel'skaya Oblast. A porcelain plant with a planned capacity of 25 million articles will appear in the Tadzhik SSR city of Tursunzade.

Fruit and vegetable canning capacities will grow at the Krymsk Combine in Krasnodarskiy Kray, and at the canning plants in Khmel'nitskaya Oblast, the Georgian SSR, and the Moldavian SSR. A brewery is to go into operation in the Komi ASSR.

Large meat packing plants are being prepared for operation in Uryupinsk, Volgogradskaya Oblast, and in Borisov, Minskaya Oblast. City dairy plants and combines are to be placed into operation in Vladivostok, Kuybyshev, Nizhniy Tagil, Pyatigorsk, Ulan-Ude, Murmansk, Tbilisi, Vil'nyus, and Yalta.

Rural Facilities

Procurement facilities are broadly represented on the accompanying map. The new elevators in Belgorodskaya, Orenburgskaya, Kiev, Ural'skaya, and Turgayskaya oblasts and in the Armenian SSR are intended to store 60,000-80,000 tons at any one time. Mills capable of processing 600 tons of grain each daily will appear at the Kiev Milling Combine and at the Kapchagay Grain Products Combine, Alma-Atinskaya Oblast. Hundreds of tons of combined feed will now be produced daily by new productions operations in

Ryazanskaya, Tul'skaya, Khersonskaya, Kirovogradskaya, and Minskaya oblasts.

Livestock complexes raising and fattening 10,000 head of young cattle will go into operation at the Balkovskiy (Stavropol'skiy Kray), Prutskoy (Altayskiy Kray), Mariupol'skiy (Donetskaya Oblast), and 50 let SSSR (Surkhandar'inskaya Oblast) sovkhozes, as well as in the Cherepovets Complex in Vologodskaya Oblast. Large pig raising complexes are being readied for operation in Omskaya, Novosibirskaya, Sverdlovskaya, Kemerovskaya, and Ivano-Frankovskaya oblasts.

Agricultural facilities include the Kaliningrad, Bashkir ASSR, Kiev, Poltava, Takhiatash, Kzyl-Orda, Issyk-Kul'skiy, and Sevan poultry factories, and the Sinyavin Poultry Raising Production Complex in Leningrad Oblast. These facilities can maintain from 100,000 to half a million laying hens. Poultry factories to be placed into operation next year at Mikhaylovo (Primorskiy Kray), Khabarovsk, Andizhan, Dzhatysaysk (Chimkentskaya Oblast), and Divichi (Azerbaijan SSR) will be producing several million birds for meat per year.

A large number of hothouse combines are to be placed into operation in the new year. They will appear in Primorskiy and Krasnodarskiy krays, in Irkutskaya, Kalininskaya, Dnepropetrovskaya, Alma-Atinskaya, and Dzhizakskaya oblasts, and in the Georgian, Lithuanian, and Armenian SSR. New production capacities to be placed into operation at the Yuzhnyy Hothouse Combine (Stavropol'skiy Kray) and the hothouse combine in Razdanskiy Rayon, Armenian SSR are distinguished by their proportions (12 hectares).

Transportation Construction Projects

The material-technical base of transportation will grow stronger in 1980. New rail lines will be placed into permanent operation: Synya-Usinsk in the Komi ASSR, Agryz-Krugloye Pole in the Tatar ASSR, and Lake Malinovoye-Lokot' in the virgin country of Altayskiy Kray. The steel right-of-way of the Baykal-Amur Rail Trunkline has already been extended to a thousand and a half kilometers. This year it will increase by about another 400 kilometers. The inaugural projects for the year include a 200-kilometer section of the Baykal-Amur Rail Trunkline from Berezovka Station to Komsomol'sk-on-Amur.

In addition we are implementing an extensive program of secondary track construction, and railroad electrification. Thus the Kamen'-on-Ob' - Karasuk, the Karasuk-Irtyshskoye, and the Bogdanovich-Kamyshlov-Tyumen' lines will be converted to electric traction. Large mechanized moorings and freight handling complexes will go into operation at the Leningrad, Magadan, Poti, Riga, and Nikolayev marine ports, and the Riga and Kotlass river ports.

The November (1979) Plenum of the CPSU Central Committee gave builders the important task of all-out acceleration of construction, reduction of above-standard volumes of unfinished construction, and improvement of work quality. Decisions of the party and government on improving the economic mechanism are also orienting the construction organizations at attaining the best end results. The indicators for the commissioning of facilities and delivery of commerical building products will become the most important ones to every construction and installation administration, trust, association, and all construction main administrations and ministries in the the 11th Five-Year Plan. Preparations for work in accordance with the new system of indicators must proceed deeply and purposefully in all construction organizations in 1980. Erecting facilities quickly and economically on a modern technical basis is a matter of honor to the builders.

11004
CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

NEW AIR TERMINALS BUILT FOR OLYMPICS DESCRIBED

Moscow STROITEL'STVO I ARKHITEKTURA MOSKVY in Russian No 12, Dec 79 pp 4-6

[Article by V. Ivanov, chief of Aeroproyekt [central office for the surveying and planning of air routes and airports]: "Air Gateway to the Olympics"]

[Text] Very little time remains before the fire of Hellas flares up at Luzhniki, announcing the opening of the 1980 Olympic Games. But even fewer days remain before the first participants in the games and guests arrive on hospitable Moscow soil. They will be arriving in Moscow by land and air from all corners of the planet. Aeroflot's international routes will be particularly popular in 1980, since they provide the fastest link between remote countries and the capital of the 22d Olympic Games.

The country's largest airports--Sheremet'yevo, Vnukovo and Domodedovo--are being prepared to receive the large traffic of Olympic passengers. At Sheremet'yevo and Vnukovo construction of new air terminals is being completed.

This journal has reported on the design of the Sheremet'yevo-2 international air terminal complex, and now the operations are mainly nearly completion.

The new air terminal was designed and built by the firm Rüterbau and the office of Mr Wilke of the firm Salzgitter (West Germany), and specialists of the institute Aeroproyekt of the USSR Ministry of Civil Aviation were also involved.

The air terminal's unique proportions can be indicated by brief figures:

i. traffic capacity--2,100 passengers per hour, which means an annual traffic capacity of 6 million persons;

ii. total floor space of the building 85,000 square meters;

iii. volume of the structure 577,000 cubic meters;

iv. floor area of operational rooms 33,000 square meter;

v. food service enterprises have a seating capacity of 1,200.

Directly alongside the air terminal building 19 parking positions have been built for large aircraft such as the TU-154, Il-62, Il-86, Boeing-707 and Boeing-747. Another 12 parking positions have been equipped close to the air terminal.

More than 1,000 passenger cars and through and express buses can be accommodated in the parking lot at one time.

Now to describe the new air terminal in a bit more detail. The construction site is on the grounds of the present Sheremet'yevo Airport, 23 km from Moscow. The air terminal is surrounded by forest on three sides and will be connected to the capital by a main highway that runs into Leningradskoye Shosse. The designers and builders have made every effort to protect the environment and to avoid any substantial clearing of the forest. This was reflected in the air terminal's compact design.

The first three floors represent an elongated decagon in plan over whose central portion rises a six-story block. A two-level flow chart was adopted for serving the passengers and processing the luggage, i.e., arriving and departing passengers are served on different levels, with no cross traffic. Short and clear routes have been achieved for movement both within the air terminal and on the terminal grounds.

We will make a brief tour through the new Sheremet'yevo-2 air terminal.

Passengers from Moscow arrive by bus and car, reach the central concourse by the vehicle ramp to the second story; on the concourse there is a general display panel concerning flights, an information desk pay telephones, and commercial stands. To the right and left are two rooms each with a floor area of 2,500 square meters where tickets are checked, customs and passport clearance are done, and luggage is processed.

So, having obtained all necessary information concerning their trip, the passengers--they still have time before their flight--can take advantage of the additional services. There are restaurants, cafes and numerous bars at their disposition. They can buy souvenirs or watch movies or television in special movie and television rooms. Nor have the little travelers been forgotten: for them there are playrooms and sleeping rooms.

If check-in for the flight has been announced, the passengers move from the concourse into one of the rooms for departing passengers.

They check in at 24 positions furnished with electronic scales and luggage kicker, a flight information board, data displays and an intercom system. Individual baggage carts and wheelchairs have been provided. Small luggage or luggage for which the passengers require special handling go to the makeup room by special elevator.

The room also has 24 stations for customs inspection and 20 cubicles for passport checks.

Thanks to all this equipment the personnel are able to provide fast but not hasty service to a large number of departing passengers at the same time.

Once they have gone through the preflight formalities, the passengers go to the short-term waiting areas or, as we have come to call them, assembly areas. If boarding has already been announced, they enter the cabin of the aircraft directly through telescopic boarding ramps.

Sheremet'yevo-2 is the first air terminal in our country that is entirely equipped with telescopic boarding ramps. Nineteen large airliners can dock immediately alongside the building at one time, and thanks to these ramps they become as it were joined to the terminal in a single processing chain.

Passenger boarding into the aircraft, as we have already noted, is from the second story, i.e., at the level of the cabin of the aircraft, so that the passengers do not have to go onto the apron, there is no cross traffic of arriving and departing passengers, and the aircraft can be prepared for the flight efficiently and without interference.

A 3-hour flight delay was adopted in the computations when Sheremet'yevo-2 was designed. What does this signify? If, say, weather conditions become bad or there are delays for some other reason, then the passengers will receive a full range of services in the air terminal, they will be able to take advantage of the stores and bars and restaurants and the lounge for mothers with small children. It is interesting to note that space has been provided in the air terminal for the holding of business meetings, press conferences, conferences of other types and so on.

Passengers arriving in the capital will be mainly served at the level of the first story.

Upon leaving the aircraft by the telescopic ramp, the passengers will descend to the first story by the stairs or escalator into one of the two arrival rooms. Here they will go through public health clearance, their passports will be checked, and they go to the luggage pickup zone, which has been furnished with numerous ring-shaped conveyors. After they receive their luggage and go through customs formalities, the passengers will go to the room for those who have come to meet them, where they will find a post office, telephones, a bank branch, stores, an Intourist office, and so on at their service.

Their route from the air terminal goes to the air terminal grounds, where cars and buses await them. Not far from the air terminal there is a new hotel with a capacity of 500 which is intended both for departing and arriving passengers.

Even though there are numerous rooms and areas, it is fairly easy to get one's bearing in the building because of the central location of the concourse and the numerous types of visual and audio information.

The third story has been set aside for transit passengers; there they can take advantage of the restaurant, the hairdresser's, the lounge for mothers with small children and other types of services.

The fourth story is taken up by a restaurant with a seating capacity of 500 and a dietetic dining room, the stewards' service and utility space.

On the fifth floor there are first- and second-class restaurants, a banquet room, and the utility and administrative space of the food service complex.

The sixth, seventh and eighth stories have been set aside for the administrative and technical services of the air terminal.

In the basement there are storerooms, utility rooms and equipment rooms.

The building was erected on a load-bearing metal frame. The intermediate stories were cast in place on sheet metal decking. The check-in rooms have a truss ceiling with a span of 32 meters, and in the space created equipment has been accommodated and ventilating and air-conditioning ducts have been run.

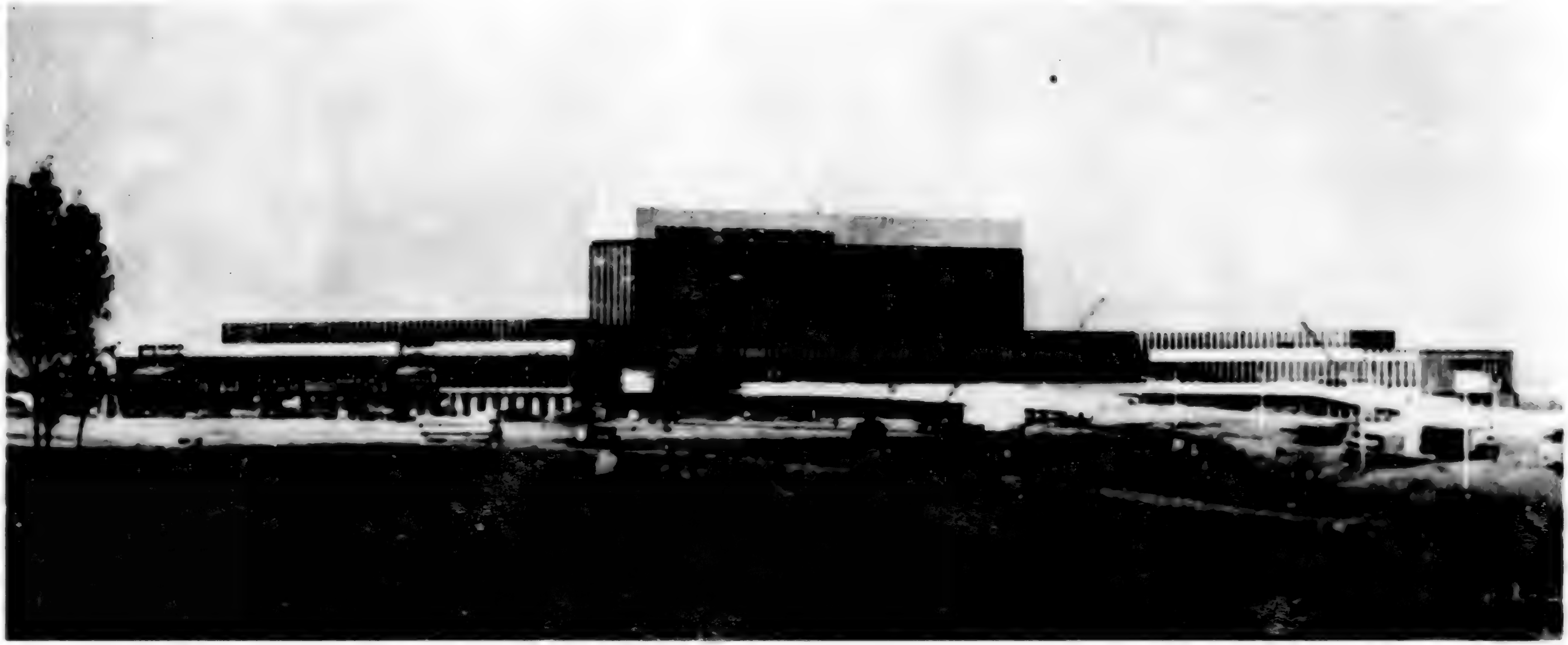
The walls are of lightweight panels faced with anoded aluminum and window frames made from aluminum alloys anoded a champagne color and glazed with dark glass. On the airfield side vertical elements (sheets) have been used over the entire facade; aside from their esthetic role, they also have a sound-proofing function, reducing the noise from the airplane engines in the passenger rooms.

The entire color range of the facade is silver-gray with intrusion (along the entire facade) on the airfield side of the red spots of the telescopic ramps. Granite, painted and anoded metal, stone chips in various shades, plastics, etc., have been extensively used to finish the interior.

Vnukovo Airport was a pioneer in Soviet airport construction. Built in 1941, it has up to now been one of the leading enterprises of Aeroflot.

The existing passenger buildings do not constitute an integrated architectural ensemble, since they were built during several different periods of construction at different times.

The construction of the air terminal we will be referring to is like its third generation: the first dates from 1941 and the second from 1964. And now this new reconstruction is for the 22d Olympic Games.



New building of the Sheremet'yevo Airport.
Overall view and section of the facade.

Sections of the facade of the airport on the airfield side. (In the foreground are the telescopic boarding ramps.)

The staff of Aeroproyekt had to prepare a design in a very short time which would not only satisfy all the demanding technological requirements, but would also unify the previous structures in an architectural sense. It moreover was taken for granted that construction would take place without interrupting the operation of the air terminal.

The architectural conception was arrived at by erecting a two-story building on the apron side over the entire length of more than 300 meters so as to envelop and unify the old buildings.

Sheremet'yevo. Hotel building for transit passengers.

The designers solved the problematical task of composing the facade by alternating the glazed surfaces of the walls of the waiting rooms and the blind blocks of the boarding areas which have a forceful effect, uniting the structure, which is plastic in plan, with an overhanging cantilever roof. Colored aluminum in the form of sheets was chosen as the principal finishing material for facing the facade.

The large-dimension segments of the facade harmonize with the huge area of the airport and with contemporary aviation equipment.

The layout called for the present processing and service areas to be retained; they have taken on a new attribute, and it became possible to improve convenience.

Departing passengers are brought by municipal motor transport directly to the flight room located on the first floor, at the level of the air terminal grounds. After checking in and delivering their luggage, the passengers go to the second story by stairs or escalator to the spacious waiting rooms, where a restaurant, cafes and lunch counters, a lounge for mothers with small children, a post office, a telegraph office, hairdresser's, and so on are at their service.

When boarding has been announced, the passengers go to clearance areas and then to assembly areas, which are also located on the second floor. It is assumed that the passengers will be taken from the air terminal to airplanes by special buses whose body is raised to the level of the aircraft doors. This will make it possible for passengers to move directly from the bus to the aircraft, and it will save a great deal of time.

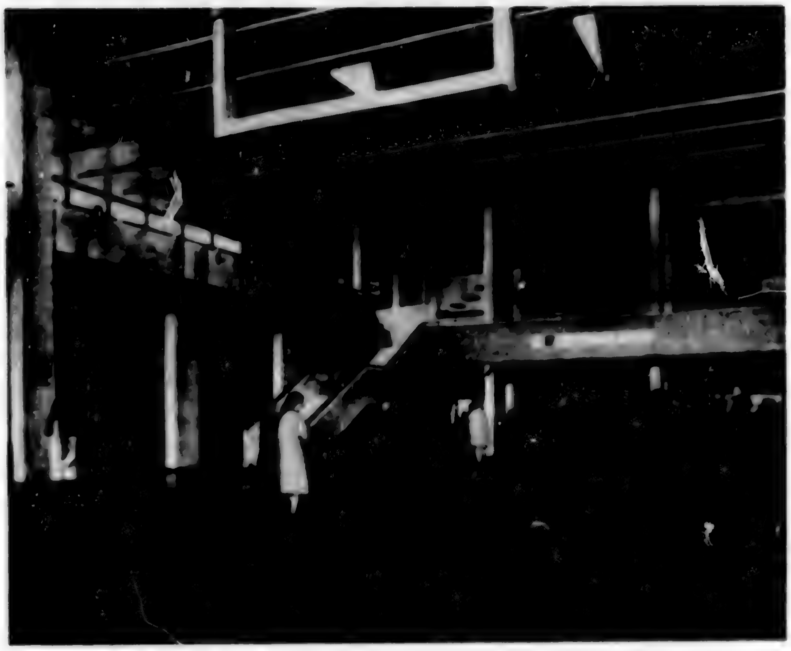
A spacious room with floor-to-ceiling windows has been set aside for arriving passengers and those meeting them on the first floor. Luggage will be delivered by means of the numerous ring-shaped conveyors. A board indicating the flight number that is easy to see from any place in the room has been set up in front of each pickup area.

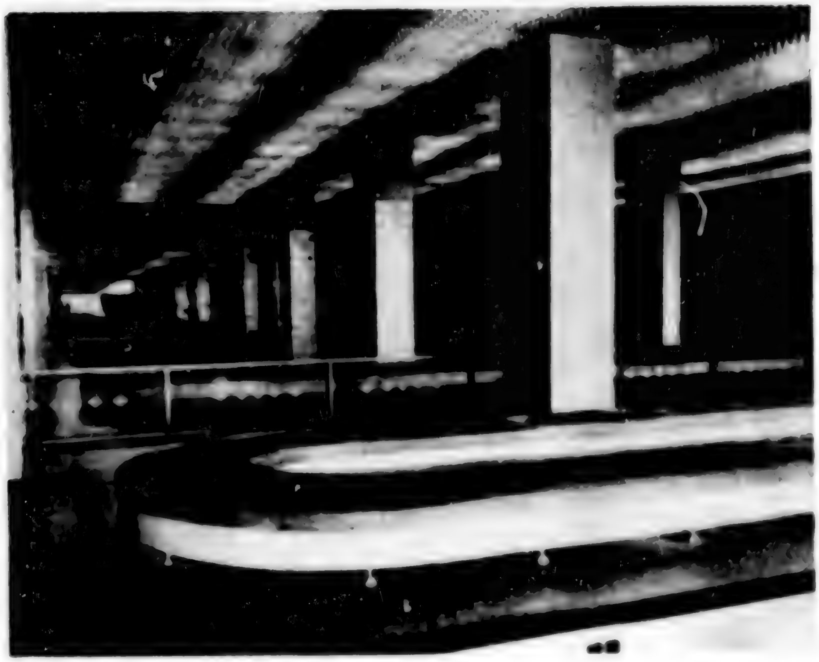
Having obtained their things, the passengers go to municipal motor transport stops. Transit passengers, having taken advantage of the services of transit passenger personnel, go up to waiting rooms.

Vnukovo Airport. Sections of the facade.

In the basement, immediately below the luggage pickup areas, there are luggage checkrooms with a capacity of 8,000 places, workshops for emergency repairs of the personal effects of passengers. There has been a considerable enlargement of the area given to food service enterprises, the lounge for mothers with small children, the post office and the telegraph office.

In all stages of processing the passengers will have clear information by means of electronic display panels, signs and the public address system.





Vnukovo Airport. Interiors of the air terminal.

Decorative art work made by Moscow artists enrich the interiors of the air terminal.

The terminal grounds have been considerably expanded, and the small architectural forms which have been erected, the flagstaff and the decorative elements bearing symbols of the Olympics will create a holiday atmosphere.

The structural components from which the new building of the air terminal was erected are prefabricated reinforced concrete with column spacings of 6 x 6 meters, 18 x 6 and 36 x 18 meters.

Colored aluminum, granite, marble, plastics, etc., were extensively used to finish the facades and interiors.

The volume of the newly erected portion of the air terminal is about 100,000 cubic meters, and the work area built is 30,500 square meters.

The design was done by a design team consisting of the architects I. Artamonova and Ye. Zakharova, and the engineers V. Balabanov, A. Molchanov and Z. Senicheva.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

OLYMPIC VILLAGE'S SHOPPING AND SERVICE CENTER

Moscow STROITEL'STVO I ARKHITEKTURA MOSKVY in Russian No 12, Dec 79 pp 6-9

[Article by A. Bazilevich, candidate of architecture]

[Text] As readers are aware, the architectural ensemble of Olympic Village is made up of several independent complexes which comprise an integrated architectural and artistic composition. The shape and dimensions of the structures in the ensemble and their location are subject to the axial composition adopted as the basic reference and unifying buildings that differ in their purpose and size into a single system. Each complex represents a rounded architectural production with its own strictly functional and technological structure and original layout and spatial organization in accordance with requirements which must be met by Olympic structures of the given type. The life of the athletes participating in the Moscow Olympic Games is envisaged according to the program traditional for international competitions. Olympic Village is furnished with all forms of services. So that the services might be better differentiated, they have been assembled in centers which after the Olympics will become public service centers at the microrayon and rayon level. That is why the dual function of the service institutions of Olympic Village has been embodied both in the spatial layout and also in the functional and technological structure of the centers built. This journal has already published a review of the design of the complex of Olympic Village, a reportage from the construction site, and a review of the athletic complex.* In this issue we publish a review of the shopping and service center.

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* See No 7, 1977; and Nos 1 and 4, 1979.

Seen from Olympic Village.

The shopping and service center brings together service institutions belonging to four groups.

The food service group consists of a dining room and restaurant with a seating capacity of 4,000, the "Russian Tea" Cafe with a seating capacity of 150, the "Moscow Ice Cream" Cafe with a seating capacity of 150, the "Dairy" Cafe with a seating capacity of 200 and banquet room, standup counters, stage and open-air terrace; there is also a separate dining room for service personnel with a capacity of 180. After the 1980 Olympics the food service group, except for the "Dairy" Cafe, will become a rayon department store--a branch of GUM (total sales floor about 10,000 square meters).

The merchandising group is made up of the department store (1,300 square meters of sales floor) and a jewelry store (about 300 square meters). Fiction and political literature, periodicals, works of art, flowers, and so on will also be sold here. After the Olympics the entire merchandising group will become a self-service department store, and the store equipment will be appropriate replaced in the same work areas.

The group consisting of the consumer service center comprises nine independent enterprises: the pharmacy, a photographer's studio, hairdresser's, a clothing repair and tailor's shops, shops for the repair of footwear, timepieces, glasses, athletic goods, still and movie cameras, appliances and other everyday articles, and a rental center. All the enterprises in the consumer service system will later serve the population of the microrayon and will not undergo transformation.

The group of storerooms, loading and unloading, management and utilities represent a kind of row of enclosed loading platforms, warehouse space, coolers, air-conditioning machinery and units, and built-in transformer substations and power systems, heating, water and sewer systems and other utilities. Plans for this group call for transformation only of the coolers, which will become storerooms of the GUM. The other space is being erected at once according to its permanent pattern of use.

In view of the center's large traffic--all 12,000 athletes will come here several times a day--large dimensions were adopted for the rooms, the mall and stairways, the porch around the building, the lobbies, and so on, which will furnish the necessary space. This approach determined the spatial organization and architectural form of the entire ensemble.

The complex' central location on the master plan of the village also contributed greatly to its uniqueness. This makes it possible to eliminate cross traffic of pedestrians and service vehicles, to organize the supply of the restaurant, department store and consumer service complex through a passage that is partly underground and directly adjoins the main city street.

The shopping and service center's tremendous size (3.5 hectares completely built up) has given the complex a dominant significance in Olympic Village and demanded compositional methods and forms which would make it possible to harmonize with the architecture of the other structures.

Basically the entire ensemble of Olympic Village was designed in the traditions of Russian and Soviet architecture. This also applies to the architecture of the shopping and service center. The systems approach and the invariant method--recent achievements of architectural science and project planning practice--helped to no small degree in the successful solution of the varied creative problems of its composition.

Independent spatial systems are clearly traced in the architecture. Each of them interacts with the others. Most vividly represented is the system of open spaces--the center's basic architectural nucleus: all the rooms are unified into a complex of buildings on the principle of a ring with communication and transportation functionally connected around the mall, which is raised over the base level of the grounds of the village and represents a man-made hill. Open plazas intended for evening walks, dances and entertainment have been located in the mall; and they are encircled by the porch which runs entirely around the building and by the passageways and stairways between the buildings of the complex. The porch is the principal concourse where the flows of visitors of varying intensity are sorted out. Not only does it link together the diverse groups of buildings, but it also smooths the transition from the light open yard to the interior space of the rooms and serves as a shelter from the rain and sun.

The mall directly adjoins the public square of the Olympic Village and is an organic architectural extension of it. The main stairway with 22 steps and an intermediate scenic landing serves as the boundary for the two areas. In addition to its purely functional purpose, the stairway can serve as a spacious speaker's platform from which one has a good view of the central square of Olympic Village and the main walk and the main entrance to the Village and adjoining Michurin Prospekt.

The space of the mall is connected by a series of side stairs to the training stadium area and the athletic center, the cultural center and the Square of Nations. The mall is also connected to the complex of the directorate, where there is a bank, a branch post office and the Village's principal management services.

Parallel to the central axis of the composition several local axes have been created so as to enrich the architectural spaces of the buildings of the complex. For example, the mall has a transverse axis directed toward the building of Moscow State University, so that the line of sight ends outside the grounds of Olympic Village. This access is reinforced in the complex' architecture by a through passageway that divides the space of the dining room and restaurant. The passage connects the mall to the rooms of the cafeteria and restaurant; here under a skylight that has been let through the upper stories and furnished with a specially made decorative crystal chandelier, the teams going to the stadiums will assemble.

Two other visual compositional axes have been created at the entrances to the dining room and restaurant on the mall side; they go in the direction of the continuous windows of the dining hall, which are turned toward the recreation areas of the Village. Along those same axes one sees from inside a beautiful panorama of the cascading ponds created in the bottomlands of the little river Smorodinka and the natural scenic slopes of the former village of Nikol'skoye, the large athletic training nucleus and a park with walks, decorative sculptures and open plazas.

The portion of the porch along the facade of the department store connects the area of the athletic center to the Square of Nations. This portion of the porch is an independent and architecturally developed axis of the complex with granite stairs going down on both sides from the mall and a vehicle entry ramp so that cleaning machines can reach the mall area.

A more intimate visual architectural accent has been created in the northwestern portion of the shopping and service center: this is the terrace of the "Dairy" Cafe. The size of the terrace (360 square meters) and its furnishings make it possible to use it not only for quiet repose with a beautiful view of the surrounding landscape, but also to set up a dance floor.

In the middle of the mall is a rectangular open court for the benefit of the rooms located beneath the mall. It has been designed as an ornamental Japanese garden surrounded by a polished granite enclosure.

The open architectural spaces of the center make an organic transition to the spaces of the dining rooms and stores and the rows of shops along the porch. The dimensions and proportions of the stores and shops (1,500, 1,300 and 300 square meters) were chosen on the assumption of a large number of visitors; moreover, they are consonant with the scale of the mall, which creates a sense of space and light. One peculiarity in the design of the interiors of the stores and shops is the maximum simplicity of the scheme for the movement of visitors, which has been done with practically no cross traffic or retracing of steps.

The principal stores and shops are open on the side of the mall and are separated from it only by the continuous glass windows.

The tectonic system of the architectural forms of the complex contributes to the unity of perception of the spaces of the mall and the adjoining stores and shops. The expression of the tectonic principle is embodied in unsupported architectural forms represented by the "soaring slab," which covers the buildings, the porch and the mall. This is all enhanced by the transparent glass walls of the buildings of the center, which remove the visible supports of the slab on the structural blocks of the buildings. The visual tectonic lightness is also furnished by the aluminum facing of the lower surface of the slab and by the row of inset lighting fixtures, which create an abundance of light at night. The monumentality of the horizontal plane of the floors of the stores, shops and mall, which are done with the textured bright colors of ceramic tiles, colored asphalt and polished marble provides a compositional contrast to the architectural lightness of the "soaring slab." In actuality the entire architecture has been so designed that the bulk of the visitors will be as it were assembled between two large horizontal planes, and the role of all the vertical elements of the architecture has been nullified so that they are not visually perceived. This approach to the architecture of the complex gives a contemporary flavor to the entire structure, emphasizes still more the traditional nature of the compositional methods and gives people a sense of unlimited freedom.

A few words about the proportional system of the architectural blocks and large spaces. A square, which regularly recurs in different versions and physical sizes, was taken as the basic unit.

The structural organization of the functional and technological areas was subordinated to the requirments of production processes and the specific nature of domestic and foreign equipment used in the dining room and restaurant, department store, hairdresser's, photographer's studio and the workshops of the consumer service center. The large production capacity and traffic capacity of these enterprises led to the principle of grouping subsidiary rooms in blocks and placing them immediately adjoining the principal functional blocks.

The main principle embodied in the layout is the straight-flow sequence of the production lines, which are located in the plane of a single story. In the buildings of the complex there is almost no vertical division of processing cycles by levels. This necessitated that adequate space be provided on the main level and resulted in the use of broad buildings, which in plan attained dimensions from 30 to 60 meters for lengths between 96 and 136 meters.

The broad structures of the buildings of the complex raised a serious problem of daylight illumination of the rooms and complicated the solution of certain utility problems, especially ventilating and heating rooms inside these deep structures. At the same time the broad structures afforded the possibility of a more straightforward architectural solution to composing the floral layouts of the stories and to use more freely such compositional methods as proportioning, extending the method not only to individual rooms, but even entire functional areas.

The sprawling character of the structural blocks of the complex demanded a unique solution for the routes of internal utility connections--air ducts, electric wiring, water and drain pipes, the fire alarm system, the telephone system, and radio and television hookups. In the complexity of their spatial arrangement and the equipment used the utility complexes of the shopping and service center are on a par with similar utilities and technical devices on, say, a modern naval vessel.

The system of construction is also one of a kind: all the structural elements were made from prefabricated reinforced concrete elements on the list of standardized products manufactured off-site.

The foundations of the dining room and restaurant, department store and consumer service center were placed on a natural footing in the form of prefabricated reinforced-concrete structural elements: pillar footings under columns and strip footings under load-bearing walls. The underground portion of the mall, which has a 12-meter span, was designed to be built from prefabricated reinforced-concrete walls and special prefabricated foundation blocks bridged by large-span slabs designed for vehicle loads.

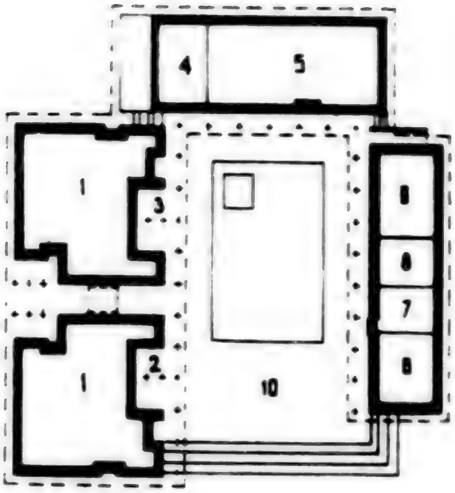
The basic column spacing of the underground portion of the buildings is 6 x 6 meters, and it is 6 x 6 and 6 x 12 meters above ground. For the first time in the practice of construction of public facilities progressive products were used for 12-meter spans, listed as KMS 101-2.75--prefabricated columns and tie-beams, which have been efficiently put into operation by enterprises of the Main Moscow City Administration of the Building Materials Industry.

Structural elements used for partitions consist of mounted prefabricated reinforced-concrete panels. The cantilever roof with an overhang of 3 meters which runs along the entire perimeter of the building is made of prefabricated elements and uses a specially designed unbroken cantilever tie-beam with a span of 9 meters and an interval of 12 meters, covered with TT-12 t slabs.

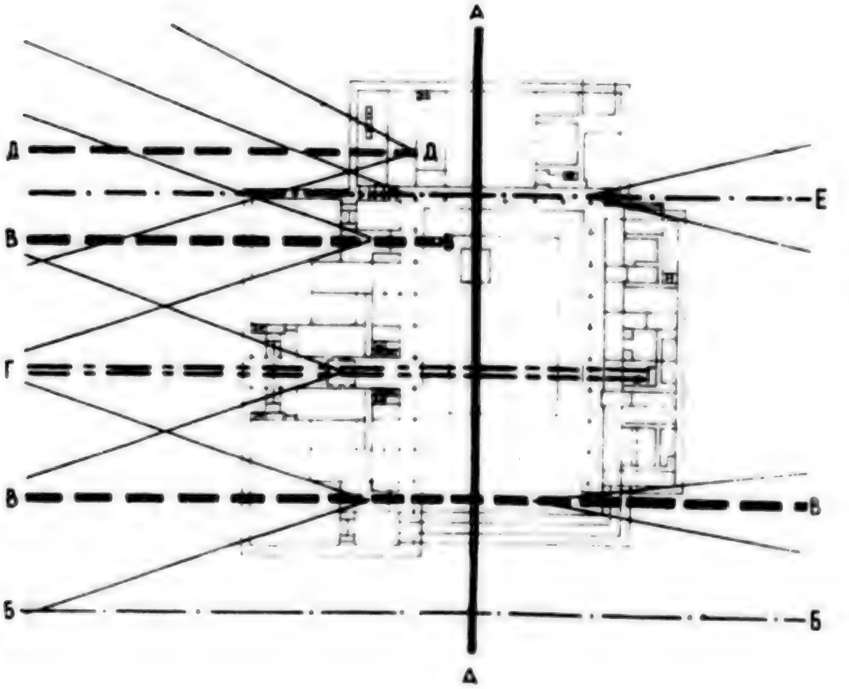
The large size of the structures of the complex caused considerable difficulties in erecting the building. Tower cranes were set up inside each structure and the structure was built up from inside and the cranes subsequently removed when construction was completed.

The smooth operation of machinery, the tower cranes and transport in the construction of such a complicated project as the shopping and service center of Olympic Village was ensured thanks to the timely drafting of an operational plan which incorporated present-day methods of integrated construction on the basis of network scheduling.

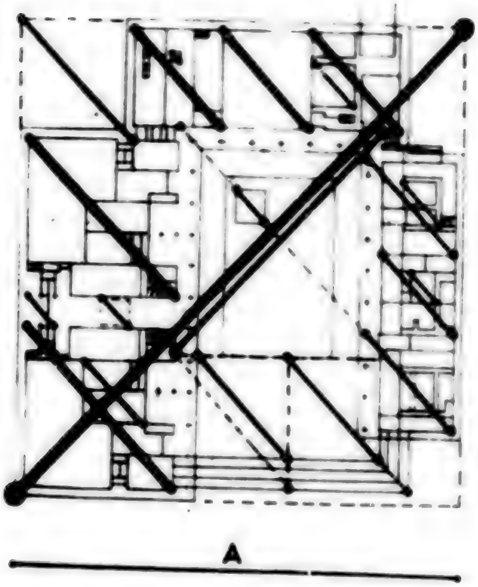
The design of the shopping and service center was developed in the workrooms of Mosproyekt-1 [Institute for the Planning of Housing and Civil Engineering Construction in the City of Moscow], and the designers were architects Ye. Barbyshev, V. Bogdanov, P. Zinov'yev, N. Pelevina and I. Studenikin, the engineers Yu. Avrutin, A. Dvorkovich, L. Kagan, V. Kovrizhkin, I. Kuznetsova and N. Mal'kov, and the process engineer of Giprotorg [State All-Union Institute for the Planning of Trade Establishments and Food Service Facilities] V. Chikolodkova under the supervision of the designers of Olympic Village: architect Ye. Stamo and engineer V. Kostenko.



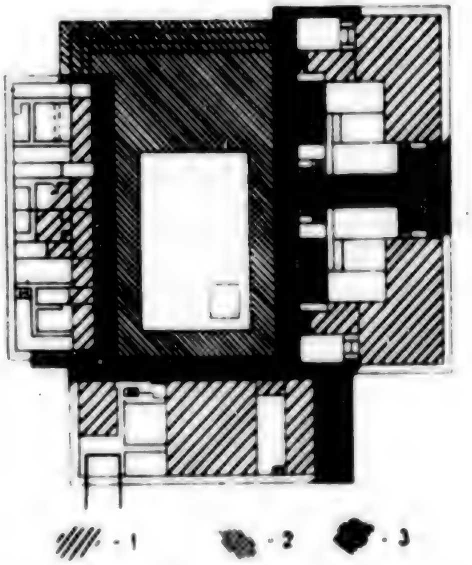
Composition of the institutions of the shopping and service center: 1--dining room and restaurant; 2--"Russian Tea" Cafe; 3--"Moscow Ice Cream" Cafe; 4--"Dairy" Cafe; 5--department store; 6--pharmacy; 7--photographer's studio; 8--hairdresser's; 9--workrooms of the consumer service center; 10--mall.



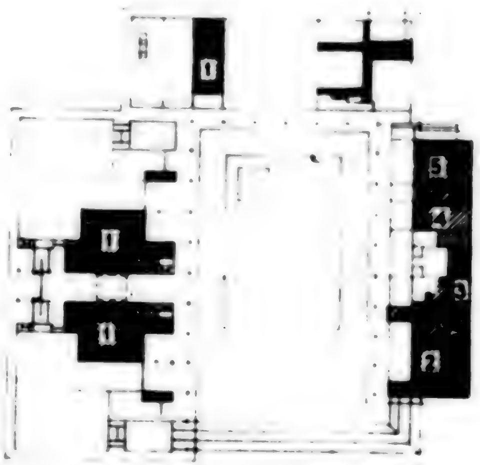
Compositional axes of the shopping and service center: A-A--main axis of the shopping and service center; Б-Б--central axis of the Village; B-B--visual axes of the dining rooms and dining room and restaurant; Г-Г--transverse axis of the mall; Д-Д--visual axis of the terrace; E-E--axis of the pedestrian connection of the porch of the mall.



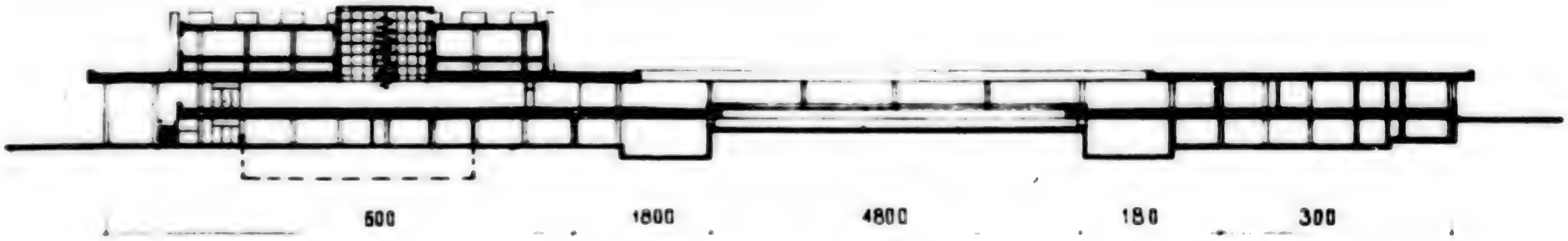
Proportional system of the plan of the shopping and service center: A--proportional module.



Scheme of spaces receiving a large volume of traffic: 1--dining rooms and stores, shops and lobbies; 2--mall; 3--mall porch.



Technological zones of the shopping and service center: 1--food service; 2--pharmacy; 3--photographer's studio; 4--hairdresser's; 5--repair shops.



Cross section.

Completion of construction of the shopping and service center of Olympic Village.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

QUESTIONS ON CIVIL HOUSING CONSTRUCTION ANSWERED

Moscow STROITEL'NAYA GAZETA in Russian 9 Dec 79 p 3

[Article by G.N. Fomin, chairman of the State Committee for Civil Construction and Architecture in answer to questions by readers of STROITEL'NAYA GAZETA: "The City in Which We Live"]

[Text] There are always many letters in the mail received by the editorial office in which readers pose different types of questions concerning civil housing construction. Such interest is understandable; there are millions of new residents. Here is what M. Nefedov from Krasnoyark writes, for example:

"We have been very lucky. We obtained an excellent two-room apartment in a new series panel housing unit. Both the housing unit itself and the apartments in it are favorably distinguished from those that are being built according to old designs. The layout, finish work and equipment are different. Here is what I am thinking: Why couldn't all housing units in our city be constructed with the same high level of comfort?"

It would be good to reveal more in detail, Gennadiy Nilovich, about those housing construction processes which are related to reorienting it from a mainly quantitative criterion to a qualitative-quantitative criterion.

Housing construction, much the same as a mirror, reflects the growth in the economic capabilities of a socialist state. I am reminded that soon after the end of the postwar restoration of the economy an industrial base was established which made it possible, as a final result, to provide families with separate apartments.

It was exactly then, in 1958, even if this seems to be a paradox, that essentially for the first time a unity in form and content was achieved in solving housing problems. Typical designs were brought into strict conformity with the economic capabilities of the state at that stage. In prewar and postwar years we built quite a few housing units that were expressive in architectural respects, the average area of them being approximately 57 square meters, yet the acute shortage of housing units led to communal habitation of such apartments. Here is a contradiction which had to be decisively overcome. This had to be done in an historically short period of time.

Yet the problem was successfully solved for that stage: the first generation of typical designs was created which satisfied the main need then--economy. The construction of such housing units with "apartments of a few square meters" made it possible to have them almost completely inhabited with single families while at the same time, not only not decreasing, but from year to year increasing the number of new homes.

However, it was not without reason that these apartments were said to be of few square meters: they had the minimum dimensions for a kitchen and other auxiliary rooms, access rooms and joint sanitation areas. The smallest overcrowding of an apartment (and families lived and grew--children came and grew up and generated their own families) gave rise to disenchantment with the previously happy new home.

Since 1963 the state has been able to apportion supplementary allocations for housing construction, and this has made it possible to somewhat improve the qualitative standard of a dwelling--the dimensions of auxiliary rooms increased and access rooms and joint sanitation areas were eliminated from construction practice.

In 1971 the present stage of housing construction began. Apartments in the housing units that were completed according to the new types of designs which were developed after the CPSU Central Committee and USSR Council of Ministers Decree dated 28 May 1969, "Concerning Measures for Improving the Quality of Civil Housing Construction" was issued, are distinguished by well thought out floor plans, increased dimensions for the living and auxiliary rooms and also by balconies. The architectural approaches for the buildings also became more expressive. By the end of this five-year plan more than half of all housing units will be constructed according to this new type of design. This is an uninterrupted process which will continue in subsequent years.

As a result of the realization of the party and government's civil housing construction policy which was mentioned above, every two years there are more dwellings made available than existed in the entire housing fund of tsarist Russia.

"I have often read that almost nine-tenths of the constructed areas are distributed among us free of charge. But can it be that the rent obtained in utilizing the home does not cover the expenses for its construction?" asks L. Petrenko from Moscow, L. Shokhin from Odessa and several other readers.

Would you be able to relate, Gennadiy Nilovich, how the constitutional right to housing is realized and disclose the arithmetic for housing construction expenditures?

Well in this case, certainly, we must once again turn to figures. If we shift from the scale of the country as a whole to calculations for a single individual it will appear no less impressive. During the postwar years there were 5.5 square meters for each person and today more than 12 meters of total area. Along with this it should be added that the population between these years grew by 74 million people. And what does it mean to increase the area occupied by a person even one meter on the scale of the country? More than 30 billion rubles need to be invested in the housing and communal economy to do this.

An apartment in a new series housing unit costs the state an average of 8,000 to 9,000 rubles. In the 20 years which elapsed after the decision to populate apartments with just one family, the expenses for a dwelling for a single family grew by 40 percent. On the whole, capital investments in housing construction last year comprised 17.5 billion rubles, including 15.8 billion rubles from public funds.

Those who suppose that, in the process of utilizing the apartments, the government is compensated for these funds in the form of rent are mistaken. Quite the contrary! Every year the state pays out another five billion rubles as a subsidy for the maintenance of the housing fund and as the housing fund grows this sum will increase as well. Yet rents have not changed in 20 years and this sum hardly covers more than a third of the expenditures for utilizing them.

The wider the range of construction, the greater the demand for quality in buildings, including their architectural expressiveness. Unfortunately, such terms as "series," "faceless," "monotonous," have become habitual for many new housing rayons. Here, for example, is L. Kurovskaya's letter from Vladimir:

"We like our ancient, age-old Russian city very much. In the central part of it there is not so much what you would call a building but, one might say, an architectural monument. It must be noted that we treat our ancient buildings with extreme care. Yet the city boundaries today are growing further; on the outskirts, large panel housing units are primarily being built. They all have the same appearance in Vladimir, Odessa and Kirov. Is it not time to limit the use of the panel building before our city finally loses its originality?"

How will you answer the reader?

In our country much is actually being done to preserve architectural monuments. We may recall the restoration of the Moscow Kremlin, the Troitsko-Sergievoy monastery, the suburban palaces near Leningrad, and the architectural monuments of Novgorod. Much work is going on in Vladimir as well.

As to the influence of massive construction on a city's appearance, concern in this regard is understandable and a solution to the problems is not simple. I have already said that there was a time when the immediate task that stood before us was how to provide comfortable housing for tens of millions of people as quickly as possible. However, the monotonous buildings must be regarded as a cost of this period.

But it would be incorrect to view architecture exclusively from the point of view of the erected building's exterior appearance and not see its social-economic essence. And if this is so, then it becomes clear that certain urban construction losses were not caused by the industrialized methods for erecting buildings alone. Both the familiar interior floor plan and the stark appearance of the facades are not organically inherent in panel type housing construction. Although it is undisputed that the need for the industrial production of large completely prefabricated structures is actually more urgent than for other methods of construction the laws inherent in it dictate the standard. But it is impossible not to see beyond to the aesthetic possibilities of these progressive methods. The architects of the past also used their standards--a system of modules and order, etc. The problem consists of discovering more fully the possibilities which may put the very same industrial methods for erecting buildings along with large scale use of plastic art at the disposal of architects.

A massive building may be sufficiently expressive. This is confirmed by the experiences of Zelenograd, Vil'nus, Navoi, Tol'yatti, Shevchenko, Minsk and other cities. The creation of expressive ensembles promotes the use of typical housing units, varying in stories and length and in the final work of the facades, as well as the skillful combination of buildings from different series and the broad use of the block-section method. Along with this it is very important to take into consideration the natural surroundings, climatic, geological and national features of the various regions of the country.

Unfortunately, our housing construction base does not completely meet the high demands which are made for urban buildings today. Many operating housing construction combines are not equipped to manufacture a wide assortment of articles. New designs for factories are developed slowly and their introduction drags on for years.

Together with an expansion of the different types of typical buildings for enriching the appearance of our cities, individual designs having architectural value are needed for hundreds of housing units, commerce sites, municipal and everyday services, schools and polyclinics.

Significant reserves in the arsenal of urban construction funds might be found in monolithic housing construction which would make it possible to emotionally enrich urban buildings. Consideration of this type of housing construction must increase. Under certain circumstances it could become very effective.

A good design is a necessary, but is by far not the only condition for the high quality of the finished product--the completed building. Unfortunately, there are quite a few signals received by the editorial office from places that speak of those things which still overshadow the happiness of new residents. Here is a letter, for example, from the Klyakhinovo family from Slavyansk in Donetskaya oblast.

"If you only knew how happy we were when they gave us the order, but when we entered the apartment we lost our heads: the plumbing was all broken, there was no gas and the electricity is turned off all the time. And you should see what was done in the courtyard! Heaps of trash with stone blocks around it. The residents turned to ZhEK [Housing Exploitation Committee] and the executive committee, but in no way did they react to our signals or our requests."

A. Guseynova from Tbilisi, I. Ananasov from Asbest and other readers who are new residents have written to the editorial office about similar troubles. What effective measures are contemplated to close all loopholes for workmen who do poor work and their protectors?

State Civil Construction conducts spot checks every year to see how the system for approving housing and public buildings for us is observed. Units were more carefully prepared for use in Belorussia, Lithuania, Estonia, several cities in the Russian Federation, Alma-Ata Baku, and other cities. But together with this, the practice of approving houses for use that have poor quality construction and installation work with many imperfections still continues in many cities. Such a practice takes on massive proportions at the end of the year when 30 to 40 percent of the units planned for the year are turned over. Instances of approving housing units that have poor quality finish work, engineering hookups and organization of public services are especially numerous.

Unfortunately, the system established by the government for approving buildings for use is sometimes violated by direct orders of local organization leaders. It is necessary to put an end to such types of violations.

At present, USSR Gosstroy, together with State Civil Construction, has outlined a number of effective measures which provides for the creation of a reliable barrier against bad workmen and those who willingly or unwillingly encourage them.

Today the concept of residential environment has become firmly established, on which basis the complexity of a structure is first understood. However, putting buildings used for cultural and everyday services into operation, organizing public services and coping with engineering work at construction sites lags significantly behind.

"In Dnepropetrovsk, we have had three microrayons built, one right after the other, with the poetic name of 'Topol'," writes technician-observer L. Litvin. "But the new housing developments are clouded by the fact that there is no ATS [Automatic Telephone Exchange] here, there are not enough schools, kindergartens, few stores and public eating enterprises. Hasn't the time come for planning, not individual buildings, but large housing complexes?"

It appears that raising such a question is completely justified. Living space is by far not the only need of residents in a modern city. Today more than 6 billion rubles are already being spent every year on structures designed for cultural and everyday use and about 4 billion for municipal construction.

Planning not for individual housing units and public buildings, but instead for urban construction starting complexes, would chiefly make it possible to solve the problem of simultaneously constructing buildings for cultural and everyday use, trade enterprises and public eating establishments along with housing units. Maybe it would be expedient in the beginning to conduct an experiment in individual cities. The diversity of a building will promote a further improvement in the living conditions of the Soviet people and this would also mean an improvement in the social effectiveness of urban construction.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

PLANNING FEATURES OF DISTRICTS SURROUNDING MOSCOW

Moscow STROITEL'NAYA GAZETA in Russian 4 Jan 80 p 4

[Interview with Leonid Vasil'yevich Vavakin, chief architect for the Moscow oblast: "The Districts Surrounding Moscow Have Individual Features"]

[Text] Leonid Vasil'yevich Vavakin, director of the Moscow oblispolkom Main APU [Architectural and Planning Administration] was appointed chief architect for the Moscow oblast slightly more than 2 years ago. Before that he worked in Giprogor [State Institute for Urban Design] for 20 years. He participated in the development of general plans and designs for structures in such cities of our country as Sochi, Omsk, Novosibirsk, Vladivostock and many others. He was awarded the USSR Council of Ministers Prize for the development and realization of the Sverdlovsk general plan.

In the capacity of Giprogor's chief architect, L. Vavakin had already directed the work on the general plans of Ulan-Bator and Erdenet which were completed at the request of the government of the Mongolian People's Republic. In remembrance of those days there is a drawing board which depicts a fragment of a future building in Ulan-Bator. The volumetric plastic art relates to the striking national features of Mongolian architecture. Tradition and modern features....

[Question] The concept of continuity in architecture has probably always had a practical meaning for you, Leonid Vasil'yevich. Isn't that so, especially now when you have become the chief architect for the Moscow oblast?

[Answer] That goes without saying; the Moscow oblast is a region that is saturated with a huge number of architectural monuments. Unfortunately, a link with the national character of Russian architecture cannot be felt in many of the buildings which have been erected in the cities and settlements which surround Moscow. This break is especially noticeable in the small towns and cities that have a rich historical heritage where the thoughtless intrusion of contemporary buildings among the structures that were turned out throughout the centuries sometimes destroys their architectural harmony. Today one of the chief goals of urban construction policy in the Moscow oblast consists of preserving and developing the individual appearance of cities and possibly of villages.

[Question] But the scale of construction is growing and therefore the contrast between the old and the new may be aggravated.

[Answer] Perhaps, if one solves the problems of building on the basis of production instead of creatively. There are still many possibilities in industrial housing construction which have not been fully discovered. The block section method of construction will undoubtedly aid in overcoming the monotony in new apartments. A single unified catalogue is aimed at enriching the architectural and artistic appearance of a building.

At present the architects in the sub-departments of the Main APU's institutes are searching for the characteristic features of individual cities. A higher class of architectural and urban construction skill is needed in order to preserve the aesthetic originality of settlements and to simultaneously use all of the capabilities of modern industry.

Recently the USSR Moscow SA [Soviet Architecture] organization examined the construction practices of small cities in the districts surrounding Moscow. The principle of continuity has been realized in the general plans for Zagorsk, Volokolamsk, Kolomna and Egor'yevsk. Their creation was preceded by an urban construction analysis of the architectural heritage.

[Question] But there are some very young cities in the districts surrounding Moscow such as Protvino, Chernogolovka, Pushchino. They have not been able to acquire traditions although the appearance of many of them makes a good impression....

[Answer] Yes, these are cheerful cities! Remember that Novella Matveevaya wrote "the essence of art is happiness. People under all signs were born just for happiness...." You can feel the master and artist's touch in these cities: in the courtyards, streets, squares, public gardens, and parks. Not one small detail has been neglected be it the individual details of housing units, children's playgrounds, bulletin boards, bus stops or flower gardens and lawns.

Architects developed their own system of planning and construction for each of these cities that more fully meets its purpose and is in accord with the natural surroundings in which it was formed. Thus, Dubna is a city of pedestrians and bicyclists. A city where there is a high level of convenience for labor, everyday services and relaxation. A city which has completely preserved the forest wealth which it had inherited.

In Protvin, Chernogolovka and Dubna architects conducted their affairs with a single client. And then we have Troitsk, our "sick child." Five reputable scientific institutes decided its fate each in their own way. Only during the current year were they able to finally resolve the general plan for the city: up until the present each settlement was built separately. This is why no center has formed in Troitsk.

[Question] Is it right to speak in general about the originality of young cities? Why historically speaking their age....

[Answer] Did you mean to say equals zero? Practically speaking this is so, but the fact of the matter is that originality is determined by the very design of a city. It is true what they say: new cities must sprout their history and traditions. Formed on the basis of progressive volumetric planning concepts cities of cosmonauts, biologists, physicists and aircraft builders acquire their own features if, in the process of construction, the individual origin characterizing its design is preserved and developed.

[Question] So young city or old there is generally only one problem: to construct it in such a manner that it will have its own features. But in ancient settlements one must also know how to preserve the stones which were laid by many generations of Russian architects. What do you think in this regard, Leonid Vasil'yevich, as a member of the Presidium of the Moscow oblast department of VOOPIK [expansion unknown]?

[Answer] In 1977, on the Main APU's initiative, three Moscow institutes completed a scheme for preserving monuments in the districts surrounding Moscow--for the first time a complete code was created for them. The golden collection of the capital's oblast includes almost 3,000 monuments to history and culture. Eleven historical cities--Vereya, Dmitrov, Zagorsk, Zvenigorod, Mozhaysk, Serpukhov, Bronnitsy, Klin and others--were placed among those that are of special value. Thus, Kolomna, for example, has a unique collection--more than 200 architectural monuments.

Social activists control not only the restoration of monuments and their use but also how the preservation of the cultural heritage is reflected in the designs for the development of cities. This question is, perhaps, more urgent in our day. The mistakes of recent years are remembered by all: the construction of multi-storied housing units close to the Dmitrovskiy Kremlin, a disruption of the historical landscapes in Borodin and Bykov, felling the ancient trees in Serednikov, and the hurried restoration of the Voskresenskiy cathedral at Novo Iyerusalimskiy monastery which had no scientific basis. Luckily, thanks to public opinion and the press, it will be restored in the manner in which the great Rastrelli intended. Here is why responsibility and still more responsibility is becoming the main criterion for the activities of architects in an ancient city.

[Question] The districts surrounding Moscow are not only the cradle of Russian culture but they also have unique natural surroundings. How can their riches be carefully dealt with under conditions of a high density of population and a rapid growth of cities?

[Answer] The forest tracts occupy more than 40 percent of the oblast's territory. There are now two preserves here--Prioksko-Terrasnyy and Zavidovskiy. The future prospects are that new preserves will be created as well as national parks. Among them are "Gorki Leninskiye," "Nizhnyaya Moskva-reka," "Verkhnyaya Moskva-reka," and "Lermontovskiy preserve," a national ethnographic park.

The general scheme for the preservation of the ecology in the districts surrounding Moscow specifies the construction of 34 zones within a radius of 50 to 70 km from the capital where more than 4 million people can relax on their off days. Designs for 14 such zones have already been worked out. Among them are Malinskaya and Klinskaya for children and Oksko-Osetrinskaya for adults. Thousands of townspeople go to the health resorts in the Petrovskoy and Klyaz'minskoy zones. The Pyalovskaya zone is being constructed. All of these zones are provided with high level engineering equipment that have no harmful effect on the natural environment.

In 1978 Mosoblispolkom's Main APU and NIiPI [Scientific Research and Design Institute] involved with the general plan for Moscow, began work on the general scheme for locating and developing sanitoriums, rest homes, resorts, dispensaries and tourist centers. The further growth of municipal horticulture and market gardening is coming about: about 10,000 hectares of land beyond the 70 km boundary around the capital have been set aside for this purpose.

[Question] The districts surrounding Moscow as well as the capital are preparing to greet the Olympiad-80. What remains to be done in this regard?

[Answer] In particular it has been decided that the highways are to be put into perfect order and their architectural appearance is to be improved. The following have been designated as Olympic highways: Gor'kovskoye, Leningradskoye, Kaluzhskoye, Kievskoye, Minskoye, Yaroslavskoye as well as Simferopol'skoye; all are routes along which the Olympic flame will travel.

The territories bordering on the roadways will be improved and trees and shrubs will be planted. In the direction of Kiev, for example, poplar lanes, characteristic for the Ukraine, will be planted. The construction of underground passageways is planned for zones with dense populations that adjoin highways. In a word, we are attempting to greet the participants and guests for the Olympiad-80 as a host should--hospitably.

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CSO: 1821

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

BARRIER DESIGNED TO PROTECT LENINGRAD FROM SEA-SURGE FLOODS

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 11, Nov 79 pp 28-33

[Article by V. N. Bereslavskiy: "And the Elements Will Be Subdued"]

[Text] The western portion of Leningrad, which faces directly on the Gulf of Finland, was for many thousands of year the bottom of an ancient sea. With time the sea retreated, but, it so happens, it is again heading for its former shores.

This is occurring, as scientists have established, because of fairly complicated weather and hydrological conditions. The paramount cause are the cyclones that are active over the Baltic. Like a gigantic pump, they pull enormous masses of water to the area of their activity, forming a swollen condition on the water area. As the cyclone subsides, the "water hill" begins to spill out in all directions in the form of a lengthy wave. This wave, usually driven by a strong wind, hits the Gulf of Finland and rushes toward Leningrad at a speed of 60-100 km/hr. As it advances, it becomes higher and higher, because of the lessening in the depth and width of the gulf, bringing flooding to the city.

Back 276 years ago, that is, the first year of the founding of Saint Petersburg, the Neva's water rose 2½ meters above the normal water level and inflicted the first damage--construction materials that had been readied for the erection of the Petropavlovsk Fortress were partly washed away. The town grew and developed, but almost yearly the water elements visited, exacting an enormous toll: hundreds of people perished, thousands of structures were destroyed, orchards and parks were laid waste, and communications facilities and bridges were destroyed.

The latest floods occurred last year, the elements for 8 times in 10 days in the fall seriously menacing the city, causing, as always, considerable damage. And while this issue of the magazine was being composed, the elements, as if wanting to be remembered, once again visited the Neva's shores. At the middle of the day, on 14 September, during a squall, the usual rise [illegible]er began. Again, urgent warnings about the threat of disaster were issued over the radio-repeating network.

The annals of Leningrad's flooding--their number has been counted accurately (245 times the city's land on the Neva delta has been flooded)--these tragic and, at the same time, heroic pages reduce the story about the city residents' struggle against the elements that come from the sea, which has been going on for three centuries now, to bare facts and figures.

The most damaging flood was the one that occurred 18 November 1824. "The Neva swelled and howled, bubbling like a boiler and swirling. And suddenly, like a frenzied wild animal, it flung itself at the city...." The water smashed everything around. It washed away 324 homes and 3,257 were seriously damaged. The elements took 208 human lives (569, according to some sources) and killed 3,600 head of cattle. One of the event's witnesses wrote: "The next day Galernaya Harbor presented a scene of the most fearful destruction, many large ships and large amounts of trash lay there in streets and yards; in some places, where there had been rows of homes, plane surfaces were created, demolished houses and roofs stood or lay across streets; a large number of streets were so littered with various debris and household utensils that it was almost impossible to pass....Fences, pickets and foot bridges were thrown in all directions. Some places were so changed that it was difficult to recognize even the most familiar street, even the site of one's residence."

It was 131 years later, on 15 October 1955, that English sailors visiting Leningrad applauded artists who had opened up before them a little page of Russian history at the daily showing of "Mednyy vsadnik," at the Academy's Theater of Opera and Ballet imeni S. M. Kirov. And on the evening of the same day they were able to become acquainted with the elemental damage that Pushkin had described. The unexpected water turned the aircraft carrier "Triumph" around and brought it to a granite embankment.

For almost half a month the city's staff had to use the city's social organizations and workers in the struggle with the floods, in order to eliminate the enormous damage that the elements had caused. This flood proved to have reached the fourth highest water level in Leningrad's history--it reached the 282-cm mark above the normal level.

Contemporaries called the 1777 and 1924 floods invasions of the city by the sea. Water rises of up to 321 and 380 cm above the normal level were noted then.

This description, published in 1925 by the city commandant's office about the latter flood, is preserved: "At 0600 hours it had reached 11 feet above the normal level, according to the tide gage of Petropavlovsk Fortress, and it seemed that the cradle of the revolution, Red Leningrad--the rebel city--would die: the lights were out, telephone communications were cut, bridges were swimming, fires raged, and in 20 minutes the machine room at the main telegraph office was flooded, and Leningrad was forced to be shut off from the common republic communications network and to wage alone the struggle against nature, not being able to hear a word of support, even from the closest cities of the Union. At 0645 hours, the waterworks, where the pumphouse and the machine room were flooded, ceased operations. Fire joined sides with the water; big houses were burning here and there in the city, the fire set by the electrical current....A wooden pavement washed away by the water made a floating bridge along a street. Hundreds of trees of Lesnyy and Udel'ninskiy parks and the city's orchards fell to the ground; in the Letnyy orchard these age-old trees, in falling, tore a multitude of valuable statues down from their pedestals and broke them...."

Leningrad retains memories about the larger floods by commemorative plaques on buildings. Several years ago at Moyka, near the Isaakiyevskaya Square, there was, surely the only monument of its kind to the floods--a granite pillar with the markings of the highest levels to which the water had risen.

What have the people done to oppose the elements, how have they fought against the "rising water"? Attempts to suppress it were undertaken during the first year's of the city's existence. Peter I ordered diversion canals to be dug at Vasil'yevskiy Island, which would give the water a place to go when the wind drove it in from the sea. But, as it has been explained, it was not the sea wind that caused the flooding. There have been years when the Neva overflowed its banks during an absolute calm.

Sixty years later another order of Peter's brought benefit. Striving to stimulate the erection of strong stone buildings on high foundations, Peter decreed that the wagon of each person arriving within the limits of Saint Petersburg would be required to turn over at the gate three stones with a weight of 5 or more pounds. And the invariable tax on ships that moored at the young city's docks were to be the same "commodity"--10-30 stones weighing at least 30 pounds. And other measures also were taken for purposes of filling in the low-lying land. This, of course, brought benefit, but raising the land above the flood-stage mark would be a difficult and expensive matter.

The literature preserves testimony that, after the catastrophic flood of 1777, Catherine II invited prominent specialists to express their judgment about what had happened. Some "experts" assured her that if the Catherine's Canal was not filled with ships so often the flooding would not cause major damage to Petersburg. In connection with this "scientific" conjecture, the chief of the city's police was reprimanded because "the ships lay so incorrectly that they prevented the Neva's water from going into the sea."

At that time the true nature of the floods still was not known. But the problem of protecting the Northern Palmyra from them agitated the minds of scientists and engineers. Several projects that were developed for this purpose are known. Some of them were simply absurd, and others, while they could have impeded the water in some degree, proved to be too complicated and expensive.

The first to guess more correctly the cause of the floods was prominent representative of Soviet science P. P. Bazen, past director of the Institute of

Means of Communications Engineers. After the catastrophic flood of 1824 he presented to the government the design of a barrier dam 21 verst long that would cut off the Gulf of Finland from Lisiy Nos to Oranienbaum. It called for the construction of a stone lock for the passage of ships and water-passage structures. This plan was called fantastic and, in the end, it was turned down.

After the Great October Revolution, the clever plan of the talented Petersburg engineer attracted the attention of Soviet scientists and specialists. In the 1930's variants of the rough-draft design for structures to protect against floods were examined. The war put a halt to these studies. In later years specialists of several Leningrad design institutes revived the search for optimal proposals.

The necessity for a reliable solution to this problem was felt with special severity when architects undertook to develop the currently existing plan for developing Leningrad. The expansion of its city limits with an outlet directly onto the gulf, the construction of new housing tracts on shore land, and, at the same time, the preservation within the flooding zone of invaluable cultural monuments, splendid architectural groupings, the largest of industrial plants, institutes and museums--all this compelled the idea of protecting the city from floods to become a problem of great state importance.

Major scientific, research and design collectives were mustered several years ago for the solution of this complicated problem. They were charged with drawing up technical and economic substantiation for the protection of Leningrad from floods, to choose the most rational and reliable variant and to prepare designs for the structures themselves. This work was done by specialists of the Leningrad Division of Gidroproyekt [All-Union Survey, Design and Scientific-Research Institute imeni S. Ya Zhuk], in collaboration with 52 institutes of Leningrad, Moscow, Novosibirsk and Khar'kov.

And so, several years of persistent labor--of analysis and studies--passed. The designers became, in time, crime-detection specialists, preparing a dossier against their "opponent." A massive "bookkeeping system" for floods was set up. Positive figures of losses were counted up. The average annual damage inflicted by natural forces was computed. It came to several tens of millions of rubles. Of course, it is no longer possible to be reconciled to such a situation!

Leningrad is far from being the only city in the world which is constantly subjected to a threat from the sea. In 1953 a storm wave, strengthened by hurricane winds, broke through protective dams in Holland in 400 places. An enormous area of the country was flooded in mere hours, 1,835 people died, 750,000 Netherlanders were left without shelter, and restorative operations required the efforts of several nations. In that same year a storm surge fell upon London, tore out a protective "lock" and cost 300 lives. Never did any of the specialists suppose that the water could rise 5.7 meters in the center of Hamburg, as it did in 1962.

The consequences of two floods in the Bengal delta in 1966 and 1970 proved to be frightful. Here, at the mouth of Asia's largest rivers--the Ganges and the Brahmaputra--a storm surge in the first case cost 15,000 lives and left 5 million people homeless, and in the second case the catastrophe reached unprecedented proportions--in about 5 hours hundreds of thousands of people died.

One of the similar catastrophes of recent times was the almost total destruction of the Australian city of Darwin from the action of a sea wave caused by the cyclone "Tracy." More than 90 percent of its buildings were destroyed. In 1976 two typhoons that passed over Japan caused that nation more than 4.6 billion yen in damage. In order to eliminate the consequences of floods and the effects of hurricane winds, 760,000 policemen, firemen and servicemen were called in.

However, perhaps nowhere in the world is the problem of protecting a large city of 4 million people so complicated by such unusual and contradictory natural factors as in the narrow throat of the Baltic Sea where Leningrad is located. This is why studies and the development of an engineering design took, in all, 10 years.

And when all the working papers were brought together at Lengidroproyekt [Leningrad Division of the All-Union Survey, Design and Scientific-Research Institute imeni S. Ya. Zhuk], it took up 114 (!) heavy books--explanatory notes, files of drawings, research data and computations.

More than 1,500 specialists of various fields were involved in the creative effort that was charged with barricading Leningrad and the nearest suburbs from the onslaught of the sea once and for all. Their proposals were reviewed at the many stages of design by special commissions of USSR Gosplan, USSR Gosstroy, the USSR State Committee on Science and Technology, the composition of which included the greatest Soviet scientists and prominent builders of hydraulic-engineering structures. The design received a high assessment. In considering the special importance of the measures, the CPSU Central Committee and the USSR Council of Ministers adopted a decree in August 1979, "The Construction of Structures for Protecting Leningrad from Floods."

Just what has to be done to implement what has been the dream of the city's residents since time immemorial? What will Leningrad's sea shield be like? Hydraulic engineering structures will stretch in a 25-km arc in the Gulf of Finland, from its northern to its southern shore, along the route Gorskaya village--Kotlin Island--Lomonosov city. They will include 11 earth and stone dams, which will be erected more than 8 meters above the surface of the gulf. Six water-passage structures, each of which will incorporate 10-12 openings 24 meters wide, will be located at breaks in the dam. At the sites of the large and small navigable channels, there will be ship-passage structures most impressive in size, with spacings of 200 and 110 meters, for the passage of large ships. A six-lane highway, which in two places will "dive" under the marine canals, will stretch along the crest of the protective complex.

Upon receipt of a storm warning--it usually arrives from Tallin 5-8 hours before the tide in the Neva delta starts to rise--powerful mechanisms will push out massive doors, which are reinforced-concrete dams on wheels, from special dock chambers that stand on the bottom of the sea. Also, automatic devices will lower steel segmented gates to close off the water passages. Thus, in an hour and a half in all, an impenetrable defense bastion will rise in the path of the threatening wave that approaches from the sea.

"Scientists and engineers have analyzed all the data for the historical period, studied the conditions that arise during floods, and found the extreme upper limits that characterize the natural phenomenon," says the chief engineer for design of the hydraulic-engineering complex, RSFSR Distinguished Builder Sergey Stepanovich Agalakov. "It was found that when a number of meteorological and hydrological conditions coincide, the wave caused by the cyclone can reach a height of five meters in the Gulf of Finland. The hydraulic-engineering structures that are to be erected have been designed for these extreme conditions, and they will guarantee full safety of the city from the waves for a thousand years."

We became acquainted with Sergey Stepanovich more than 10 years ago. When they charged him with this work at Lengidroproyekt, it was as if the burden of all the doubts and misfortunes of his predecessors had been heaped on him. But then this suspiciousness, and even a certain timidity, passed--the assigned task was immense, important and interesting. Agalkov grew accustomed to his work, considered it the main thing in life, and, in surmounting a great multitude of obstacles, he has brought it to a logical conclusion--to the development of working drawings, according to which an enormous construction project will last 10 years. The specialist's enormous experience and high engineering sophistication helped, of course, in the task's success. He began as an engineer at Svir', and during the war he developed important strategic facilities for the North. Then he was engaged in the creation of majestic hydraulic-engineering power systems and was the chief design engineer for the Krasnoyarskaya GES, which still holds the "palm for first place" in level of hydraulic-engineering on the planet. Then he was an advisor to the UN on hydraulic engineering.

Many such specialists participated in the work to create the design of Leningrad's sea shield. I managed during these years to meet several of them in scientific laboratories and design offices, to fly in helicopters along the proposed route, to observe the work of those who surveyed the ice on the Gulf of Finland, to go out into the gulf on ships after the last flood, and to converse with the designers of unusual implementing mechanisms and the architects.

What primarily interested the scientists and specialists? It was necessary to determine the optimum location of the complex in the gulf, and this proved to be an extremely complex matter. Both the depth and the geology of the rocks on the bottom influenced the choice, as did the location of construction materials close to the route. In all, it was necessary to solve an equation with many unknowns. The specialists were busy for many years with the study of all the questions, and then they gave exhaustive, precise, scientifically substantiated answers, which were coordinated in the draft of a unified, integrated program of engineering solutions.

In Studio No 13 of LenNIIproyekt, RSFSR Distinguished Architect, USSR State Prize Winner A. V. Zhuk and architects V. M. Fraynfel'd and V. I. Lemekhov worked to impart to the hydraulic-engineering structures a most expressive and memorable appearance. For the hydraulic-engineering complex will be the first extensive Leningrad panorama on the path of passenger ships coming into port; it will become a sort of marine calling card.

Such circumstances also dictated architectural and layout solutions that consider, naturally, the engineering and functional characteristics of the structures. The dominating elements of the whole complex will be the ship-passage installations at the main and minor ship canals. The silhouettes of the vertical masses thrown up here to a height of almost 100 meters will be visible at distant approaches to the protective arc.

Mutually connected towers that stand 200 meters apart will rise up symmetrically in space on the main waterway. The operational-control services--controller and observer posts, from which the tending personnel should have a good view--will be placed in their divergent "wings," which will be supported by a system of stays.

The solution of the ship-passage structure at the small waterway was coordinated with the main sea gates. The single vertical mass that hangs here has been assembled into an integral stressed massif, and it has been directed visually toward Kotlin Island.

Both vertical compositions, with their size, scale and treatment, can obviously "support" a substantial portion of the marine space, emerging as centers of the whole ensemble. They set off Kotlin island with the characteristic silhouette of the Kronshtadt Cathedral, which intensifies the perception of the complex.

Brevity, clarity and, at the same time, expressiveness of architectural solutions also distinguish the water-passage structures. Precise vertical masses for housing the hydraulic-engineering gate lifters, their repetitive rhythm, and the frequent change in bridge crossings and transport isolators preclude monotony for the long drawn-out spatial composition. The ancient forts, which once served as a fiery shield for the city, are singular in outline and dimensions and supplement the complex's panorama.

Let us cite some more figures that can give a notion about how technically complex were the tasks which the builders' collective had to solve. The main sea gates will weigh 10,000 tons. They will sustain, during a surge, a force of 25,000 tons, hurricane winds, and the onslaught of ice fields a meter thick. No one else in the world has created anything like them. During analysis, the engineers found a multitude of original engineering solutions. Tens of millions of cubic meters of rock, sand, gravel and concrete will have to be laid to build the dam in the gulf, tens of thousands of tons of metal structure and equipment will have to be installed. In order to haul all this to the construction site, a railroad train three times as long as the distance from Leningrad to Vladivostok would be required.

Special attention was paid in the design of the unique hydraulic-engineering complex to providing good sanitary conditions for the Neva Bay's water area. Joint efforts of the scientists of 20 scientific-research institutes have given a precise prognosis: the protective structures will not lead to a substantial change in hydrological, biological or sanitary conditions.

The speeded up construction in Leningrad of the hugest of purification complexes will, of course, help here. One of them, on Belyy Island, is already operating, and the other, on the northeast outskirts of Leningrad, is being built (information about its erection can be found from material being published in this same issue of the magazine).

With the appearance of the structures for protection from floods, new possibilities are opened up for further development of the health-resort zone of Leningrad. For an enormous internal water body about 400 square kilometers in area will be handed over, to be at the disposal of city residents.

Incidentally, the erection of the structures that will protect from floods are already being taken as "operational." It is being considered, for example, in the drafts of the master plans for development of the Lomonosov-Petrodvorets-Strel'na area, the city of Kronshtadt, and communities on the northern edge of the gulf region.

We have often used the future tense today in telling about the hydraulic-engineering complex, but much can also be said about the present. Operations have started in the water area and on the shores of the gulf, and the work fronts each month are becoming ever wider. Thousands of workers, engineers and builders of an All-Union Komsomol shock construction project are being readied to invest their efforts in the assault on the sea.

Yuriy Romual'dovich Kozhukhovskiy, chief of Dormost [Road-Bridge Administration] of the Lengorispolkom [Leningrad City Ispolkom], is one of the specialists who are coordinating the efforts of the various design and production collectives. He is actively participating in coordinating the engineering design in some 20 ministries and has presented it to special commissions. Kozhukhovskiy is well acquainted with similar protective hydraulic-engineering structures that were built in the Netherlands and the FRG. These are being looked into, keeping in mind, naturally, all the ins and outs of the forthcoming construction project.

"It is very important right now, when preparatory work on laying the approach roads to the shores, on piercing the route of the ship canals along the future structures and on erecting moorages and the buildup of quarries has begun, to find solutions from the point of view of construction strategy," explains Yuriy Romual'dovich. "For example, we are already involved in the high prospects for speeding work at the Sever construction-industry site at Gorskaya village. A barrier not subject to the elements will go out from here in a taut arc towards Kotlin, shielding Leningrad and the suburbs. It is from here that the first tens of thousands of cubic meters of rock, sand and gravel will be send to be laid in the body of the dam, and from here that concrete mix and reinforcements, metal structural and formwork will start out for the site. A shock springboard for the assault on the gulf will be established here."

Such a unique complex can be run only on the basis of the newest technological principles. The large experience that Leningrad's builders and installers have must be used to the maximum. It is proposed, for example, to assemble the units of the water-passage openings at docks on shore and then transport them afloat to the place of installation. The tunnel under the Sea Canal between Kanonerskiy and Gutuyevskiy islands of the Neva delta are being built under such a system. These and many other solutions will also help to speed up the work in the Gulf of Finland.

The desire to speed up solution of a socially important task--to protect Leningrad forever from flooding--permeated the proceedings of a meeting of the city party organization's economic activists that was held in Smolnyy, at which the decree of the party and the government was discussed.

The years will pass, and future generations of Leningraders will know about the terrible floods only from literary sources and from the evidence on the commemorative plaques and obelisks at Isaakiyevskaya Square. The participants of the unprecedented construction project, which is now beginning, will tell them about how the last page in the struggle with the elements was written. It would seem that when the sea shield rises up to protect the city and high waves will never again descend on Leningrad, a last marker about the floods will be set up--about the time of completion of construction of the majestic hydraulic-engineering project.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

ARCHITECTS' HELP NEEDED IN PLANNING TYUMEN' REGION CITIES

Moscow STROITEL'NAYA GAZETA in Russian 4 Jan 80 p 3

[Article by A. Ryabushin, doctor of architecture; A. Zhuravlev, candidate of architecture; and V. Kovalev, candidate of architecture, of TsNII [Central Scientific-Research Institute] for the Theory and Science of Architecture]: "The Tyumen' Area Is a Land of Cities"]

[Text] The assimilation of West Siberia's natural riches, which is majestic in scale and pace, inevitably involves the creation here of large cities with a high level of comfort and social, cultural, and domestic services.

Much has been done in this area. Practically all the new cities of the Ob' region are being built on the basis of master plans, housing tracts are being formed, and the shaping of city centers is commencing.

The tasks of developing the region require a more rapid growth in the amount of housing construction, but only half of the housing planned is being built. There are not enough clubs, movie houses, cafes, stores and medical institutions in the new cities. The requirement for children's institutions are being met by 50 percent in the best case--as a result, thousands of mothers cannot work in their specialties, despite a severe shortage of personnel.

How are the plans for putting apartment houses and social, cultural and domestic facilities into use to be fulfilled? Primarily the DSK's [housing construction combines] in Surgut, Nizhnevartovsk and Nadym must be brought to design capacity as quickly as possible, after arrangements are made for the industrial output of apartment houses that meet local conditions and for the stable delivery of structure for fully prefabricated apartment houses and construction materials from other cities. The erection of wood-structure apartment houses of few stories, which are extremely appropriate for northern conditions, especially in the settlements where there are new oil deposits, could be of great help.

The problem of creating municipal utilities grids is becoming especially severe. Conditions are complicated, and the work is expensive in time and money. It is useful to apply here the experience of those who build the oil and gas fields, who are erecting complicated industrial facilities by assembling consolidated industrial modules that are manufactured under factory conditions at specialized enterprises.

West Siberia needs the constant attention of leading design organizations and the active assistance of highly qualified architects. Gosgrazhdanstroy [State Committee for Public-Building Construction and Architecture], RSFSR Gosstroy and the ministries concerned recently approved a detailed list of measures aimed at improving the quality of development, the execution of which will depend greatly also upon the activeness of local party and soviet organs. Master designers for the new cities of West Siberia have been named. In order to solve responsively the problems that arise during construction, integrated offices for designers' surveillance and working design are being established. This form of active involvement of designers in an actual buildup has proved itself well. An example of this is the activity of the LenZNIIEP [Leningrad Zonal Scientific-Research and Design Institute for the Standard and Experimental Design of Housing and Public Buildings] branch in Surgut and of working groups of LenNIIP [Leningrad Scientific-Research and Design Institute for Urban Development] in Nefteyugansk and of TsNIIP [Central Scientific-Research and Design Institute] for Urban Development in Tobol'sk.

Right now the second stage of urban-development work has started, and it is necessary to convert from quantitative indices to a rise in the qualitative level of the urban environment. The way to a convenient and attractive city is to carry out the main principles of the master plans, primarily integration of the buildup and completion of the most important urban groupings and civic improvements. Three-dimensional organization of riverfront panoramas and facades is an important urban development task. For Surgut, for example, the spit at the confluence of the Ob' and Sayma is of key importance. A city center is being formed here. Elimination of the temporary structures between the developed land and the river and the forming of an expressive facade for the development that is exposed to the Ob' floodplain are exceptionally important for consolidation of the parts of the city that are disjointed here. Finally, it is time to overcome the state of isolation of Nizhnevartovsk from the Ob' shore. The clearing of the shore of haphazard structures, a reinforcement of the city's utilities and services structures against erosion, the creation of a convenient, well-appointed waterfront and sports complex and park that are exposed three-dimensionally to the river, as called for in the master plan--all these are necessary for the city to acquire its own authentic image. In Nefteyugansk the shaping of a city facade on the high shore of the flow of the Yuganskaya Ob' will be solved to embody the urban-development concept. Nadym is located around a lake that is rare in beauty, and it is surrounded by a relict cedar and larch grove. A natural phenomenon is in need of a worthy architectural setting. In considering the uniqueness of this task, it is desirable to use mainly individual designs here.

In order that West Siberia will have a new and higher level of urban development, it is necessary to take a new look at all the components of this complicated process and to evaluate them searchingly. We shall be frank: there is much here that is not satisfying. Primarily the quality of the structure received from the DSK's. The variety of articles is scanty as to mix, color and surface finish. The designers propose good ideas, but the builders often "simplify" them, to the detriment of the functional and artistic quality of the buildup. As a result, discontent among the residents is caused.

The most urgent thing for Siberian cities is the question of shaping the production zones, which, in some cases, occupy a third of the city's land. Hurriedly erected in the initial period of economic assimilation of Tyumenskaya Oblast's North, they are a quaint conglomerate of buildings and structures that vary in design, materials, number of stories and degree of permanence....Attempts of various organizations to distinguish "their" entry structures from the common series intensifies the architectural disharmony. The architect's foot still has not truly trod here. City authorities, who lack the power to interfere in development of the industrial land, are not in a position to change anything. Meanwhile, the problems of building up the production zone are inseparable from questions of building up the city.

How to embrace them in a single city-development theme? First, a design organization should serve as the master designer for the production zone, and a chief architect of the industrial zone and a working group should be named responsible for introducing designs for the buildup. Only in this way can order be brought into the layout and three-dimensional compositions of the industrial buildup and its architectural and artistic appearance be developed at a high professional level.

It is no secret that the imprint of young cities is determined greatly by the level of civic improvements and landscaping and the presence of minor architectural forms and their quality. In the new cities of Tyumenskaya Oblast's North, work on civic improvements has, in essence, only started, and not by far has due attention been given to these important elements of the urban environment. But indeed, success is not to be achieved without it. The fact is that, under the severe local natural conditions, even the preparation of an ordinary lawn is a difficult problem, for the solution of which special scientific developments are required at times.

Meanwhile, for the supervisors of contracting organizations, all this is vexing interference with the main job--that of carrying out the plan for introducing the housing area. Is this not why civic improvements are being executed, as a rule, hurriedly, uneconomically and incompletely? There are cases where an apartment house (especially one turned over during the winter) will not do in any way at all, and occupation is stretched out for a long time, and so the great amount of work the builders do provokes not praise but reproach. One cannot be reconciled to a continuation of this. Civic improvements must be kept on the same footing as the main operations in implementing the design for development, for without it you do not create a city environment worthy of man.

Questions of civic improvements should be solved now at the design stage. Leading design organizations should work out for each city (and possibly also for each city rayon) a list of minor forms and make sure that they are put into effect. As domestic and foreign experience indicate, this area of architectural creativity presents inexhaustible possibilities for the display of a designer's imagination. The existing standard designs of small details are far from being perfected: they are banal and haphazard, the variety is poor, and the various elements have not been coordinated with each other.

It must be said that superb childrens' playgrounds can be seen in some microrayons of Nizhnevartovsk, Surgut and some other cities. Little tower houses carved from wood, wheelbarrow sandpiles, and figures of folk-tale personages and beasts delight the eye. But these are all examples of the individual creativity of professional artists. So it is that civic implementation of this type is extremely expensive and, obviously, cannot be recommended for large-scale use. The problem can be solved only by industrial production. A set of small details that functionally complement each other, are stylistically correlated, and are made from concrete, metal, wood, plastic or combinations thereof is needed. In developing the products line, it is important to consider climatic conditions. Summer in West Siberia is brief, but civic improvements are usually designed for the warm season of the year. And so it happens that in the winter the space within housing blocks and in the streets is transformed into a snow-covered wasteland. Meanwhile, where there is much snow in the winter, barriers between the sidewalks and the roadway of the street acquire functional qualities: without them it is difficult for pedestrians and drivers to get their bearings.

One of the reliable means for raising the artistic level of a buildup is color. Especially under northern conditions, where nature has been stingy with pigments.

The experience of Petersburg-Leningrad and of our northern neighbors--Finland, Sweden and Norway--indicate how effective is the promotion of color palettes and the use of bright and deep color tones in city development. In this case even the northern variants of standard housing that are not rich in sculpturing begin to work actively in the city's composition.

Of course it is necessary, in so doing, to avoid variegation and clumsiness, which are not less but even more dangerous than sameness. Workers here are waiting for the advice of the scientific institutes and for specific help. And, of course, for pigments that are attractive, durable and reliable.

A decorative surface finish for reinforced-concrete wall panels would help to distinguish apartment house faces, but this output of the housing-construction enterprises is still beneath criticism. Indeed there are quite good display models, but it is just their introduction into mass production that is being delayed intolerably. Perhaps a designers' operating group should be created for the DSK's in Surgut, Nadym and Nizhnevartovsk.

In some cities of the Ob' region (Nefteyugansk and Surgut) one can see works of the monumental arts that have been set down successfully in the urban environment. However, not always do the funds expended on these works have a major artistic yield. Often the placement of the monumental products in the buildup is haphazard and, as a result, the pathetic element of the artistic works that is exerted is inconsistent with the more than modest architectural face of the buildings. Evidently, the work of the monumental artists should be placed under the monitorship of architects. This will help in the more effective use of the funds of the various enteprises and organizations for common interests. For each city the task of developing an integrated program for the appearance of the monumental arts is urgent.

The precipitate development of cities of the West Siberia region is opening up broad horizons for creativity in all areas of architectural activity and for testing of the boldest design ideas.

It is the professional and civic duty of Soviet architects and builders to provide for worthwhile progress in urban development in the Ob' oil region.

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